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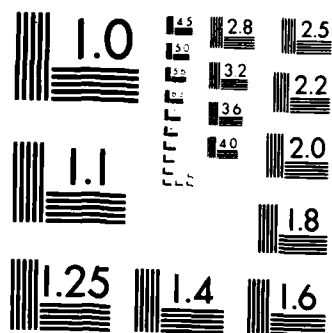
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by

BOLESŁAW A. BOCZEK

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This paper discusses and specifically includes comparative NATO/Warsaw Pact dependence on critical resources, externally supplied; determination of the extent, ways and places in which competitive political-economic positions or attempts to establish positions have or should reflect either resource dependence or an intent to deny needed resources to adversaries; policy recommendations.		

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"RESOURCE RIVALRY IN THE THIRD WORLD"

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Resource Rivalry in the Third World

by

Boleslaw A. Boczek

Paper prepared for the Conference on "NATO, Warsaw Pact,
and the Third World" at The Lyman L. Lemnitzer Center for
NATO Studies of Kent State University, April 11-12, 1984

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Introduction

The tension between the concept of an alliance geographically limited to the area North of the Tropic of Cancer¹ and developments and events beyond that area has been a major concern of the Allies in the 35 years of NATO's history. For example, the United States' desire to avoid colonial entanglements of its European allies chiefly contributed to the strict delimitation of the Treaty area; the United States involvement in South-East Asia produced much friction within the Alliance; and the U.S. Administration's perspective upon the turmoil in Central America as a part of the East-West confrontation is viewed differently by the other members of NATO. In all these and similar situations it has become obvious that, despite the decolonization of the European overseas empires, the tasks of NATO cannot be limited to the defense of the Allies' home territories but must consider all the complex strategic, political, and economic elements of the growing confrontation with the Soviet Union outside the NATO treaty area, and in particular in the regions of the Third World. For it is the emergence of the Soviet Union as a global power capable of projecting its might far beyond the borders of the Soviet home land to distant areas of the Third World that has contributed more than other developments to alerting the Western Alliance to the existence of security problems outside of the geographical limits of the Treaty area.

Now since a major portion of the world's energy and non-fuel mineral resources, vital for the economy and thereby the defense of the West, is found in the Third World, concern has recently been growing about the future availability of these resources to the West. In particular a new dimension of the Soviet threat has joined the older concerns of the military balance, arms control, subversion, and others, namely the fear that the Soviet Union has embarked upon a "resource war" against the West, designed to deny strategic materials in the Third World to the West while gaining control of them for itself, thereby bringing about the collapse of NATO and the rest of the Western industrialized world.

This whole issue of a possible strategic resource confrontation against the Soviet Union in the Third World has generated a considerable debate in the West, and primarily in the United States, conducted in daily press, popular and business-oriented magazines, professional journals, and television, as well as at professional meetings and congressional hearings.²

The purpose of this study is to find an answer to the question whether and, if so, to what extent these alarms are justified. The analysis will focus on the strategic non-fuel minerals but concerns about the West's access to energy resources will also be examined. In its general outline the study is made up of three parts. The first part is designed to provide a background to the focus of the inquiry. It will begin by defining the concept of strategic materials and the related concepts of dependence and vulnerability and subsequently identifying major categories of materials which may, and in most cases, indeed are of strategic importance to the Western industrialized world. Second, since the resources at issue are located in the Third World, the paper will examine the strategic resource situation in the major regions of the Third World with particular emphasis upon southern Africa and the Persian Gulf. Finally, the current domestic resource situation of the West, including the United States, Western Europe, Japan, Canada, and Australia, will be assessed in comparison to the resource posture of the Soviet Union and the Warsaw Pact as a whole. The second, central, part of the study will identify and assess a variety of perceived Soviet threats to the West's access to strategic resources in the Third World. As far as possible the analysis will attempt to distinguish facts from the Soviet Union's intentions, capabilities, and perhaps phantasies, but necessarily some of this discussion will be of speculative nature as well as based on empirical experience. The third and final part will briefly summarize the study's argument and offer tentative conclusions concerning the issue of resource rivalry in the Third World. Subsequently some policy measures will be suggested to be taken by the Western allies in response to any threat that Soviet behavior may pose to the West's supply of strategic materials in the Third World.

Part I. General Background

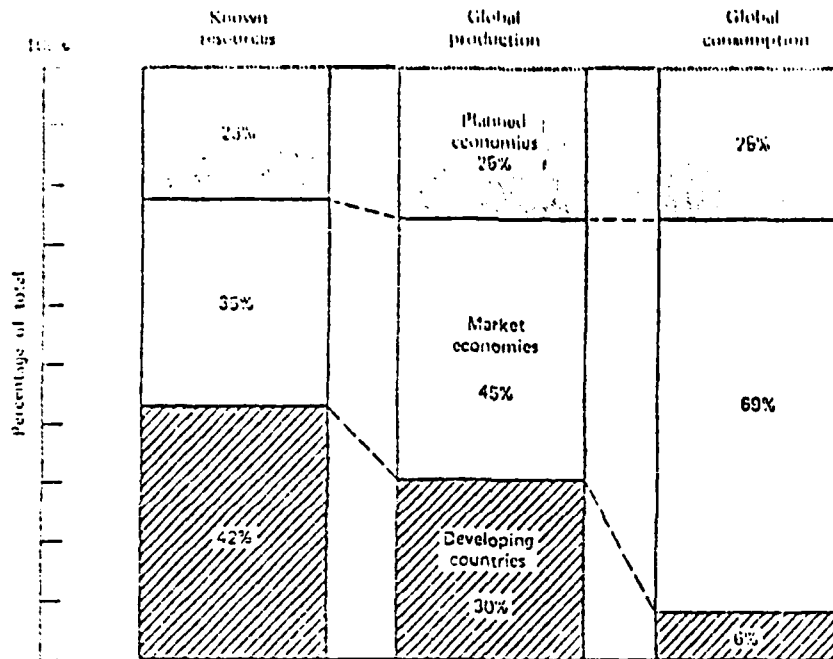
1. Strategic Resources: Definition, Dependency, Vulnerability.

Definitions of the strategic nature of a material resource vary depending, in addition to the analyst's approach, on the country and even the branch of industry involved, but in very broad terms it can be said that from a national perspective a resource is "strategic" if it is not found or produced in the country in sufficient quantities to sustain an essential, especially defense-related, industry, the nation thereby becoming significantly dependent on the supplies of such resource from foreign sources.³ Strictly speaking, in this sense no industrialized country is entirely self-sufficient but, as discussed below (Part I. 4), the Soviet Union appears to approximate this situation. On the other hand, Japan is a familiar example of a nation almost totally dependent on imports of its strategic materials. The United States, which until the 1950s enjoyed relative self-sufficiency, has in the recent decades moved more toward the import dependency end of the scale. Except for Australia and Canada, its allies are in a much worse position, however, as described later in this Section (Part I. 3).

Although the industrialized Western world consumes some 69 % of the world's raw material resources, compared with only 6 % consumed by the Third World and 25 % by the centrally planned economies, a large portion of such resources, including strategic materials, is found in the Third World countries.⁴ This fact is of fundamental importance for the whole question of the East-West rivalry for resources in the Third World. Figure 1 gives a comparative picture of known resources, production, and consumption in the three basic groups of nations.

There are, of course, various degrees of a resource's strategic nature from a nation's point of view. They may range from mere import dependency - a normal phenomenon in today's "interdependent" world and, in principle, no cause for alarm - to an increasing degree of import "vulnerability". The latter concept is distinguished from dependency by a number of criteria, but at least one of the following four: 1. a sufficiently critical need for the material by the nation's industry, such that a prolonged

Fig. 1



Comparative raw materials resources, production, and consumption in three basic groups of nations in the world. Source: Based on estimates in the article "Crisis in Mineral Resources" in SFMA Review published by Melra Consulting in Paris, France, September 7, 1979.

Source: Szuprowicz (note 3) p.3.

interruption would entail catastrophic economic and military consequences; 2. lack of adequate domestic resources; 3. limited potential for suitable substitute materials; and 4. lack of alternative sources of supply.⁵ Analysts in the United States, West Germany,⁷ and Great Britain⁸ have approached the problem of vulnerability in a more "scientific" way, developing national strategic materials vulnerability indices. By assigning numerical values to the critical factors affecting the supply availability for each specific material they obtained a sort of strategic status for the material involved. Concrete results of such quantitative studies will be noted later on in this paper (Part I. 3), but here a few general comments appear to the point. In preparing the indices it is necessary to identify a reasonably exhaustive number of, first, critical danger points inherent in the physical properties and global distribution of the material and, second, the events and conditions conducive to a crisis and regarded as "trigger points" which affect the availability of materials, such as, for instance, war, civil turmoil, nationalization, embargo, terrorist attacks, and the like.⁹ In this type of study it must be borne in mind that whereas certain factors, such as, for example, the number of producers, production levels, and import dependence, can be numerically expressed, other, especially political and ideological, factors cannot be readily quantified and rather arbitrary scores must be assigned to them. Still it is claimed that a useful comparative index can be developed if numerical values are assigned in a consistent manner to all materials.¹⁰

It is obvious from what has been noted above that any material can be regarded as "strategic" under certain circumstances. For example, for many Third World countries grain must be considered a strategic commodity since to a large extent they have to rely on imports to provide food for their populations. In principle therefore the term "strategic" need not necessarily apply to materials directly related to military aspects of national security. For purposes of this study, however, of interest are materials considered strategic from the perspective of the Western industrialized nations, and therefore the following summary

review will be limited to this category of resources.

In general, two categories of strategic materials can be distinguished: energy resources and non-fuel minerals. The use of resources as a weapon to achieve a political objective is usually associated with energy resources, and in particular with the oil embargo applied by the Arab members of the OPEC in 1973. Oil and natural gas are not the only sources of energy and a number of countries (China, India, South Africa, Czechoslovakia, Poland, and East Germany) rely on coal and lignite as the source of their energy demand. Other sources of energy include hydroelectric energy, nuclear power, and less common sources, such as geothermal, solar, tidal, and wind energy. It is, of course, beyond the scope of this paper to deal with all these kinds of energy as they relate to any East-West rivalry in the Third World. Over the past decade a most abundant literature has sprung up dealing with all aspects of energy and stimulated by recurrent "energy crises" and uncertainties about the future supply of energy in the industrialized Western countries.¹¹ This study will deal with petroleum-related issues insofar as they are relevant to its main focus, that is, the East-West confrontation over strategic resources in the Third World.

As far as the non-fuel minerals are concerned, it is impossible to compile a list of minerals critical to the economy and defense of the West as a whole because of very widely differing degrees of import dependency and vulnerability among the Western industrialized nations. As a matter of fact, even in the United States there is no agreement on the identity and number of strategic materials and the degree of their vulnerability from the U.S. perspective. (See Part I. 2). Generally speaking,¹² non-fuel strategic materials include basic metals and raw materials, such as iron ore, bauxite and alumina, copper, nickel, tin, zinc, and lead; non-metallic materials, such as diamonds, asbestos, fluorspar, graphite, and asphalt; precious metals, such as gold, silver, and platinum group metals; nuclear materials (uranium, plutonium); rubber; grains and foods; and -the most numerous category- the more exotic high technology materials, many of which have only recently been introduced in advanced industries. They find appli-

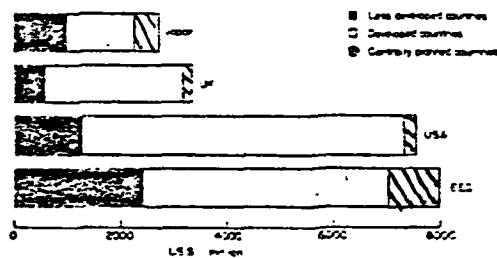
ation in manufacturing electronic equipment, lasers, jet engines, space vehicles, missiles, and other sophisticated industries. Table 1 offers a comprehensive survey of the major uses of 35 high-technology materials. Military application of 33 critical materials is summarized in Table 2 .

2. Strategic Resources in the Third World

Since specific geographical regions of the Third World are examined in more detail elsewhere in this volume, this study will limit itself to outlining major features of the Third World as producer and supplier of oil and non-fuel minerals to the rest of the world. In general, the Third World countries are estimated to possess about 42 % of the known resources, which is some 7 % more than the relatively more depleted reserves of the Western market economies. However, the developing countries' production of raw materials amounts to 30 % of the world's total, the Western market economies accounting for 45 %, and the planned economies for 29 % of that total.¹³ That is why, contrary to a widely held view, production of non-fuel minerals is actually dominated by the developed Western and centrally planned economies, in particular the United States, Canada, Australia, and the Soviet Union. Furthermore, the developed Western countries, except Japan, are dependent on imports from the Third World for a relatively small percentage of minerals, as shown in Figure 2. However - and this is crucial - there are certain materials, vital for the industrialized countries, whose reserves are found mainly - at least 50 % of world production - in the developing world. Oil is, of course, the chief resource among them: about 3/4 of the total world's "published proved" reserves at the end of 1981 were located in the Third World.¹⁴ In addition, as far as certain major vital non-fuel minerals are concerned, the developing countries, including South Africa, possess the bulk of the world's reserves of such resources as bauxite, chromium, columbium, industrial diamonds, platinum group metals, tantalum, tin, and some other more exotic materials. In terms of production, however, the Third World countries are leaders only in the case of oil, tin, cobalt,

Fig. 2

THE NEW ECONOMIC ORDER AND WORLD MINERAL PRODUCTION AND TRADE*



*Source: Imports of ferrous and non-ferrous metals for Japan, the United Kingdom, the United States, and the European Economic Community countries. Based on data from: United Nations Conference on Trade and Development, Hand-Book of international trade and development statistics. United Nations, New York, 1976.

Source: A Congressional Handbook (note 2) 361.

Table 1

Material	Aerospace	Aircraft	Catalyst	Cryogenics	Electronics	Fiber Optics	Gyroscopes	Instruments	Jet Engines	Magnetohydrodynamics	Microwaves	Nuclear Reactor	Optics	Rockets	Semiconductors	Solar Systems	Superalloys	Thermoelectric Fusion	Xerography
Beryllium	•	•			•		•					•							
Bismuth												•							
Cadmium		•											•						
Cobalt	•	•	•	•	•				•			•						•	
Columbium		•	•	•					•			•			•			•	
Cesium										•									
Europium					•														
Gallium					•														
Germanium					•			•				•							
Gold					•	•										•	•		
Hafnium						•				•									
Indium		•						•						•					
Iridium								•					•						
Lithium																•	•	•	
Magnesium	•	•																	
Niobium																		•	
Osmium																			
Palladium	•				•			•						•					
Platinum			•					•						•					
Rare earths			•		•											•			
Rhenium			•																
Rhodium																			
Ruthenium																			
Selenium														•		•			•
Silicon																			
Silver						•													
Tantalum	•				•							•							
Tellurium																			•
Thorium													•						
Titanium	•	•																•	
Tungsten	•						•						•		•				
Uranium	•	•	•									•							•
Yttrium			•		•							•				•			
Zirconium												•							
Vanadium																		•	

Major uses of high-technology materials.

Source: Szuprowicz (note 3) 18.

Table 2

Material	Aircraft	Ammunition	Armor Plate	Cartridge Casings	Detonators	Drugs	Explosives	Fuels	Gun Barrels	Helicopters	Helmets	Jet Engines	Plastics	Night Vision	Nuclear Reactors	Nuclear Shielding	Photography	Rocket Motors	Semiconductors	Shipbuilding	Steel: Arms	Space Navigation	Stainless Steels	Submarines	Water Treatment	Transistors
Aluminum	•			•									•						•							
Antimony		•																								
Asbestos		•																								
Barite					•																					
Beryllium	•									•		•	•		•							•				
Chromium		•	•						•			•											•			
Cobalt	•											•														
Columbium	•											•	•					•					•			
Copper		•		•																•						
Germanium														•												
Gold																			•							
Hafnium																	•									
Iodine												•			•											
Lead		•																								
Manganese																							•			
Molybdenum													•							•				•		
Nickel	•	•							•			•						•					•	•		
Opium						•																				
Petroleum							•	•																		
Potash							•	•																		
Quinine						•																				
Rubber	•																									
Shellac		•																								
Silver																	•									
Tantalum	•																		•							
Tellurium																									•	
Thorium	•												•		•											
Titanium	•										•	•														
Tungsten	•														•								•			
Uranium							•								•				•		•			•		
Vanadium	•										•				•											
Zinc		•																			•					
Zirconium															•			•								

Major military uses of critical materials.

Source: Szuprowicz (note 3) 20.

and bauxite. The last two mentioned minerals meet the test of import vulnerability from the point of view of the United States. (See below Part I.3).

Among the Third World regions two stand out as uniquely endowed by nature with major resources vital for the well-being of the industrialized West. The first one is the Persian Gulf area concentrating, according to data for the end of 1981, 53 % of the world's oil reserves and accounting for 27.3 % of world production.¹⁵ The other one is southern Africa or, more extensively, High Africa, sometimes referred to as the Persian Gulf of strategic minerals. This region possesses by far the largest reserves of strategic minerals in the world. The countries of High Africa, from Gabon and Zaire in the North to South Africa in the South, and especially South Africa, Zaire, and Zimbabwe, possess virtually all among the strategic non-fuel resources: 95 % of chromium (South Africa, Zimbabwe, Madagascar); 86 % of platinum group metals (South Africa); 83 % of diamonds (Zaire, Botswana, South Africa, Namibia, Angola); 64 % of vanadium (South Africa); 53 % of manganese (South Africa, Gabon); and 50 % of gold (South Africa, Zimbabwe) and fluorspar (South Africa). Sizable portions of other mineral reserves are also located in the region (columbium/tantalum, uranium, asbestos, mica, cobalt, copper, nickel, zinc, graphite, phosphate, gypsum, silver, among other minerals and metals).¹⁶ In terms of production, the area accounts for 50 % or more of the world output of gold, diamonds, platinum group metals, vanadium, germanium, cobalt, and significant amounts of many other minerals, including, besides uranium, columbium, tantalum, and titanium, three metals on U.S. most critical list (Part I. 3). The extremely high production and reserves position of South Africa and its role as the major supplier of strategic materials to the West is emphasized by all analysts.¹⁷ After South Africa, Zaire, Zimbabwe, and Zambia are probably the most important non-fuel mineral producers in southern Africa, but other countries of the region also possess significant productive capacities of strategic materials.¹⁸

In contrast to southern Africa, the remaining part of the continent appears rather poor in strategic resources. Still, Africa (Nigeria, Gabon, Algeria, Libya, and Egypt) possesses 8.3 % of the world's oil reserves¹⁹ and deposits of uranium and bauxite.²⁰

Compared to southern Africa, Latin America's share of the world's strategic minerals is not large. At the end of 1981 Latin America's share of published proved oil reserves amounted to 12.5 % of the world total. In production Mexico overtook Venezuela with 4.4 % of the world total compared to Venezuela's 3.9 %.²¹ Among the non-fuel minerals bauxite (Jamaica, Suriname, Guyana), counted in the United States among the eight crucial minerals, is the most important. In addition, Latin America produces 25 % of the world's antimony (Bolivia, and, much less, Mexico); 29 % of silver (Mexico, Peru, and lesser amounts in Bolivia and Chile); 17 % of tin (mainly Bolivia); 18 % of beryllium (Brazil), and less significant amounts of some other critical minerals.²² It must be borne in mind, however, that Latin America, and especially Brazil and Argentina, presents one of the world's largest mineral potentials.

China is also believed to have large amounts of untapped mineral resources,²³ but is still dependent on imports of many strategic non-fuel minerals, such as chromium, cobalt, and platinum group metals, for example. It is, however, the second largest producer of tungsten.²⁴ China's share in world oil reserves amounted to 2.9 % at the end of 1981,²⁵ but an intensive exploration, especially off-shore, has been embarked upon by the Chinese government. The Indian subcontinent is not, at the present time, a crucial area from the point of view of resource rivalry in the Third World. Mica is the major strategic material exported by India.²⁶

3. The Strategic Resources Situation of the West

One important link in the argument of those who are persuaded that the Soviet Union is engaged in a resource war against the West in the Third World is the extent of the West's dependency on imports of strategically sensitive materials from politically unstable regions of the Third World, and especially the Persian Gulf and southern Africa. This Section will review the strategic

resources status of the West, including not only the United States and its NATO allies but also Australia and Japan.²⁷

There is consensus that the Western World is increasingly dependent on import of many strategic materials from the Third World countries and finds itself in a very disadvantageous situation relative to the resources status of the Soviet Union. Table 3 offers a comparative survey of relative import dependence of Japan, European Community, the United States, China, and the Soviet Union for 16 strategic materials, based on the average data in the late 1970s. The vulnerability of Japan, a major metals producer, which depends at least 90 % on imports of strategic minerals, is striking. Western Europe, also an important processor and producer of refined metals, is not in a much better shape and any serious disruption of critical materials would have grave consequences for the economy and political stability of the area.²⁸

In comparison to its European NATO allies and Japan, the United States appears to be in a much better position. However, although until 1950s this country was still, on balance, an exporter of minerals and the necessary imports of strategic materials were cheap and secure, it has, over the past 30 years, moved rapidly into a position of import dependency, adding, as the largest consumer of raw materials, considerably to demand for resources available in the Third World.²⁹ In view of the even faster growing demand in Western Europe and Japan and the entry into the international markets of the Soviet Union, China, and some other developing countries, this decline in the U.S. domestic resource capability has accelerated international competition for raw materials.³⁰ At the same time the fact that the Western nations consume large amounts of raw materials, quite out of proportion to their populations, has contributed to developing with the Third World countries an image of the West as bent upon exploiting the resource patrimony of these countries.

There are all kinds of statistics illustrating the United States' reliance upon imports of essential minerals and other materials, and the frequently conflicting estimates of vulnerability

Table 3

Strategic Materials Import Dependence of Several Countries
(Amount of Imports as Percentage of Apparent Consumption)

	Japan	European Community	United States	China	Soviet Union
Oil	XXXXXXXXXX	XXXXXXXX	XXXXX		
Iron ore	XXXXXXXXXX	XXXXXXXX	XXX	XX	X
Aluminum ^a	XXXXXXXXXX	XXXXXXXX	XXXXXXXXXX	XXXX	XXX
Diamonds	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX	
Rubber	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXX	XXXXXXXXXX
Platinum	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
Tungsten	XXXXXXXXXX	XXXXXXXXXX	XXXXXX		XXX
Cobalt	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XX
Uranium	XXXXXXXXXX	XXXXXXXXXX			
Copper	XXXXXXXXXX	XXXXXXXXXX	XX	XXX	
Manganese	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		
Chromium	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	
Nickel	XXXXXXXXXX	XXX	XXXXXXXXXX	XXXXXXXXXX	
Tin	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX		XXXXX
Zinc	XXXXXXXXXX	XXXXXXXXXX	XXXXXX		
Lead	XXXXXXXXXX	XXXXXXXXXX	X	XXX	X

Source. National Foreign Assessment Center, U.S. Joint Chiefs of Staff, 1978, U.S. Bureau of Mines, and other data compiled by 21st Century Research.

^a Includes imports of bauxite, alumina, and aluminum. Note: Each "x" represents 10% of apparent consumption met by imports from all sources.

Source: Szuprowicz (note 3) 56.

vary depending on the materials included on the "strategic" list and the time frame involved. The following review relies on the categorization adopted in the Congressional Research Service Handbook which, in turn, derives most of its data from the statistics of the U.S. Bureau of Mines.

Three categories of materials of particular concern for the nation are distinguished. First, there are 45 "minerals and materials considered most essential to the domestic economy." The production, consumption, and import reliance of these materials are presented in Table 4. It can be seen that the United States is 100 % dependent upon importation of 8 of them; 90 -99 % dependent upon importation of 5 of them; and 50 -80 % dependent on imports of another 12 of these materials. Second, among this first category, 29 minerals and materials are considered sufficiently "strategic and critical" to warrant inclusion in the national stockpile list.³¹ The Strategic and Critical Materials Stock Piling Policy Revision Act of 1979 defines such materials as "materials that (A) would be needed to supply the military, industrial, and essential civilian need of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need." Finally, limiting the scope of the strategic materials even further, many experts believe that out of these 29 materials 8 are most important "minerals and materials for which the industrial health and defense of the United States is most vulnerable to potential supply interruption". These ultra-strategic eight minerals, all meeting most or all criteria of vulnerability, are: bauxite/aluminum, chromium, cobalt, columbium, manganese, platinum group metals, tantalum, and titanium.³³ Of major importance for estimating a country's vulnerability to disruption of strategic materials supply is the distribution and reliability of foreign sources of supply. In this respect the U.S. position generally follows the pattern of the Western countries as a whole: If the overall volume of U.S. imports of essential minerals and materials is taken as the basis, most non-fuel mineral imports come from

Table 4

Mineral/Metal (units)	Domestic Production	Apparent Consumption b/	Imports	Net Import Reliance, percent c/
Manganese (1,000 s.t.)*	0	1,170	825/650	97
Mercury (76 pound flasks)	33,200	75,000	25,000	49
Mica (s.t.)	0	2,400	2,450	100
Molybdenum (s.t.)	73,500	31,500	1,000	E
Nickel (s.t.)	16,000	197,000	170,000	73
Phosphate Rock (1,000 s.t.)	59,500	43,500	550	E
Platinum Group (1,000 troy oz.)	6	2,962	3,370	87
Potash (1,000 s.t. & 0)	2,600	7,100	5,450	62
Quartz Crystal (s.t.)*	200	NA	450	NA
Salt (1,000 s.t.)	45,100	49,600	5,500	8
Selenium (s.t.)	250	413	300	40
Silver (1,000 troy oz.)	32,000	99,000	78,000	E
Strontium (s.t.)	0	19,900	19,900	100
Sulfur (1,000 s.t.)	13,000	16,880	2,760	13
Talc (1,000 s.t.)	1,258	705	15	E
Tantalum (s.t.)	0	740	1,250	97
Thorium (s.t. ThO) ²	0	35	30	100
Tin (s.t.)	3,300	58,700	52,400	84
Titanium (s.t.)*	W	27,000	4,500	W
Ungatone (s.t.)	3,500	17,000	6,000	54
Vanadium (s.t.)	5,000	5,900	7,400	15
Zinc (1,000 s.t.)	716	1,014	573	58

Notes:

a/ Data derived from U.S. Bureau of Mines, Mineral Commodity Summaries 1981, Washington D.C. Govt. Print. Off., 100 p. Figures for 1980 are not final and are subject to revision.

b/ Apparent consumption includes recycled material.

c/ Net import reliance is the sum of imports minus exports plus adjustments for Government and industry stock changes and is expressed as a percentage of apparent consumption.

d/ Aluminum equivalent of domestic bauxite production plus the aluminum equivalent of net import reliance.

e/ W = withheld by Bureau of Mines to avoid disclosing company proprietary data.

f/ In some cases where data have been withheld, numbers in parentheses are approximations based on extrapolations from previous years.

g/ NA = Not available

h/ E = Not exports

* For explanation of data for commodities marked with an asterisk (*) see discussions in following text.

TABLE 6. U.S. Production, Consumption, and Import Reliance on Selected Mineral Commodities, 1980 ^{2/}

Mineral/Metal (units)	Domestic Production	Apparent Consumption b/	Imports	Net Import Reliance, percent c/
Antimony (short tons - s.t.)	14,000	37,500	20,000	53
Abrastose (1,000 s.t.)	89	377	340	76
Bauxite and alumina (1,000 s.t.)	1,840	5,990 d/	21,200	94
Beryllium (s.t.)	W e/	330	60	W
Bismuth (s.t.)	W	1,230	1,200	(90) f/
Cadmium (s.t.)	1,630	4,300	2,350	62
Cesium (pounds)	W	27,000	NA g/	100
Chromium (1,000 s.t.)	0	530	990	91
Cobalt (s.t.)	0	8,800	8,000	93
Columbium (s.t.)	0	3,700	4,150	100
Copper (1,000 s.t.)	1,295	2,230	573	14
Corundum (s.t.)	0	440	440	100
Diamond (1,000 carats) ^{h/}	0	45,800	22,800	100
Fluorapatite (1,000 s.t.)	86	1,295	1,055	84
Gallium (pounds)	NA	20,940	14,550	70
Gold (1,000 troy oz.)	930	3,900	4,900	28
Graphite (1,000 s.t.)	0	49	57	100
Gypsum (1,000 s.t.)	12,100	20,211	7,400	38
Iodine (s.t.)	W	4,350	3,100	(74)
Iron ore (1,000 s.t.)	77,300	99,700	32,500	22
Lead (1,000 s.t.)	634	1,146	147	E h/
Lithium (s.t.)	W	3,200	160	E
Magnesium (1,000 s.t.)	170	110	4	E

Source: A Congressional Handbook
(note 2) pp. 78-80.

developed Western countries, especially Canada and Australia, and the relatively secure Latin American area (primarily Mexico and Brazil).³⁴ However, as shown in Table 5, for the bulk of the imports of the eight most critical materials the United States must depend on the Third World. Although none of the 20 countries listed in this Table is a sole supplier of any of the eight, several countries of southern Africa are major co-suppliers of cobalt or chromium, for example. South Africa, Zaire, and Zimbabwe are the three most important countries from the standpoint of the United States.³⁵

It must also be remembered that the United States imports some of its requirements for four minerals and metals from the Soviet Union. In 1979 the Soviet Union was its second principal source (after South Africa) of chromium and platinum group metals, both among the eight most critical materials. In addition, the Soviet Union was its second largest supplier (after Canada) of gold and third largest source (after South Africa and Chile) of vanadium.³⁶

In the overall picture of the West's strategic minerals situation Canada and Australia stand out as valuable sources of a number of such materials, bauxite, nickel, and titanium, for example.³⁷ For obvious geographical reasons Canada and Australia are major suppliers of the United States and Japan respectively. However, even they do not possess significant reserves of some of the most vital strategic minerals, such as chromium, cobalt, and platinum group metals.

Import dependency of the West in the area of energy, mainly oil, is a more familiar fact than dependence on imported non-fuel minerals. With the bulk of oil reserves located in Third World's regions, the West's major areas of concentration of oil reserves are, in percent of the total world published proved reserves, the United States, 5 %; Western Europe, 3.7 %; Canada 1.6 %; and Australia about 1 %.³⁸ Since 53.3 % of the world's reserves are located in the Persian Gulf area (see Part I. 2) which supplies 70 % of the West's oil, the Gulf area is the locale of potential energy resource rivalry between NATO and Warsaw Pact countries.

Table 5

EIGHT STRATEGIC AND CRITICAL MATERIALS AND THEIR
U.S. IMPORT SOURCES*

Material	Estimated Dependence percent		Countries From Which Imported and Percent of Imports
	1980	2000	
Bauxite/ Alumina	94	80	Jamaica (17/42), Guinea (32, bauxite), Australia (78, alumina)
Chromite/ Ferrochromium	91	89	Rep. of S. Africa (40/52), Philippines (15, chromite), USSR (16, chromite), Turkey (10, chromite), Yugoslavia (11, ferrochromium), Zimbabwe (9, ferro- chromium)
Cobalt	93	76	Zaire (42), Belgium-Luxembourg (16), Zambia (13), Finland (6)
Columbium	100	100	Brazil (66), Canada (9), Thailand (7)
Manganese ore/ Ferromanganese	97	100	Rep. of S. Africa (9/38), Gabon (44, manganese ore), Brazil (24, manganese ore), France (22, manganese ore), Australia (13, manganese ore)
Platinum group	87	83	Rep. of S. Africa (53), USSR (22), U.K. (12)
Tantalum	97	87	Thailand (35), Canada (13), Malaysia (10) Brazil (4)
Titanium (ilmenite)	47	67	Australia (56), Canada (32), Rep. of S. Africa (7)

*Source: Data from table 2, section II A., and U.S. Bureau of Mines. Mineral
Commodity Summaries 1981. Washington, U.S. Govt. Print. Off. 189 p.
Materials selected as especially strategic and critical are discussed
in section III B.

Source: A Congressional Handbook (note 2) 355.

4. The Strategic Resources Situation of the Soviet Union and Its Allies

In the debate over the strategic resources one school of thought argues that the Soviet Union is driven to compete for such resources in the Third World because of diminishing supplies at home. (See Part II.3) It is therefore worthwhile to review at least the main features of the current strategic resources posture of the Soviet Union and its allies. It must be stressed here, however, that there are conflicting estimates of the Soviet Union's energy and non-fuel minerals situation, some analysts believing the Soviet Union to be self-sufficient and others asserting that it is experiencing shortages of certain materials, including even some of those which it is exporting to obtain hard currency needed to acquire Western technology and grain. The controversy is, of course, compounded by the fact that actual data on non-ferrous, precious, and rare metals are shrouded in secrecy under the Soviet legislation.³⁹ It is a well known fact, however, that the Soviet Union occupies a privileged position as a self-sufficient country relative to the Western world, as shown in Table 3. It must also be emphasized that the Soviet Union and the other "planned economy" countries as a group enjoy a remarkably balanced picture of raw material reserves, production, and consumption. (See Figure 1)

The Soviet Union is the most self-sufficient country insofar as essential strategic and critical minerals and materials are concerned. As shown in Table 3, it has abundant resources of many of them and accounts for a very large share of the world's production of these materials.⁴⁰ The following paragraphs will deal first with the non-fuel minerals and subsequently energy resources of the Soviet Union and its Warsaw Pact allies.

The Soviet Union has second largest reserves of gold, manganese, and platinum group metals, and sizable reserves of virtually all other strategic minerals and materials which in the United States are on the list of 29 included in the stockpiling list. (See Part I.3) In addition to iron ore, the Soviet Union is the largest producer of many of these materials (manganese, chromium, nickel, tungsten,

platinum, titanium, lead, zinc, cadmium, beryllium). It is the second largest producer of copper, cobalt, gold, tin, and diamonds (in addition to natural gas and asbestos), and the third largest producer of bauxite, mercury, molybdenum, and uranium (and coal).⁴¹ One interesting feature of the Soviet non-fuel minerals picture is the fact that in some materials, including bauxite/alumina, copper, chromium, diamonds, fluorspar, lead, nickel, platinum group metals, titanium, uranium, and zinc, the Soviet share in world production appears to exceed that of its estimated share of reserves, which would suggest that it is in these materials that the Soviet Union might eventually become import-dependent.⁴² Even today there are some minerals and materials that the Soviet Union imports. They are - in addition to rubber - bauxite and alumina, fluorine, mica, tin, tungsten, antimony, and barium, the import dependency in these minerals not exceeding 50 % of consumption, however.⁴³

Since the potential import-dependency of the Soviet Union is in the "resource war" debate frequently related to Soviet designs concerning southern Africa, the question of the Soviet chromium, cobalt, and platinum situation deserves some more scrutiny. It is true that high grade chromite deposits in more accessible areas have been depleted and exports of this mineral have somewhat dropped off,⁴⁴ but new technology ("beneficiation") now allows utilization of low-quality chromites of which the Soviet Union is estimated to have supplies for about 70 years at current rate of production.⁴⁵ As far as the production of cobalt is concerned, in which the Soviet Union is second after Zaire, the Soviet reserves are extensive but located in Arctic areas (Norilsk mining complex), requiring expensive and capital-intensive processing facilities to obtain cobalt and platinum as by-products of copper and nickel, thus ending marginal dependence on imports.⁴⁶ Reduction in exports of platinum seems to have been only temporary and due to the transitional period of expanding new projects in Siberia.⁴⁷ To sum up, there is no doubt that the Soviet Union encounters some formidable problems in developing new mining capacity in order to obtain these three crucial and other vital materials.⁴⁸ However, despite some recent shifts in the

Soviet export/import pattern it appears that these are not permanent trends and that the Soviet long-term prospects in strategic minerals will continue to be bright. There are two basic reasons for this conclusion: first, the existence of vast untapped resources and, second, the determination of the Soviet leadership to give a high priority to its mining industry in order to secure possibly highest self-sufficiency in strategic materials (import dependency simply does not fit in the Soviet way of thinking and strategy) and develop exports to the West (like natural gas exports) in order to obtain hard currency and technology, both badly needed for further expansion of the Soviet economy. All this does not necessarily mean that selectively the Soviet Union would not be willing to take advantage of opportunities offered by favorable circumstances in the world strategic minerals situation.⁴⁹

Compared with the abundance of minerals in the Soviet Union, the East European allies' share in Warsaw Pact's total of strategic resources is rather modest. Among the major strategic minerals produced by the Soviet Union's Warsaw Pact allies are: aluminum and bauxite, 8.9 % of world production (Roumania and Hungary); cadmium, 3.9 % (Poland, Roumania, Bulgaria); copper, 3.5 % (Poland); lead, 6.2 % (Bulgaria, Poland, Roumania); manganese, 1 % (Hungary); mercury, 2.5 % (Czechoslovakia); nickel, 0.7 % (Poland, East Germany); and zinc, 5 % (Poland, Bulgaria). In addition, Czechoslovakia produces some uranium of which negligible amounts are also produced in East Germany and Hungary.⁵⁰ Incidentally, Albania, the ex-member of Warsaw Pact stands out as the third largest producer of chromium, after the Soviet Union and South Africa.⁵¹ The extra-European members of CMEA (Mongolia, Cuba, and Vietnam) are of relatively minor importance as producers of strategic minerals.⁵²

Since the volume of oil reserves is a state secret in the Soviet Union, there are conflicting estimates of this much debated "enigma of Soviet petroleum " ⁵³ the examination of which goes far beyond the scope of this study.⁵⁴ In one estimate, at the end of 1981 the Soviet oil reserves amounted to some 63

billion barrels, that is 9.3 % of the world total, a slight decrease from 9.6 % in 1980 and 10 % in 1979. The Soviet oil production increased 2.4 % in 1979; 2.9 % in 1980; and 1 % in 1981, reaching 12, 370,000 barrels a day. With 21 % of the world's total production, the Soviet Union continued to be the world's largest oil producer.⁵⁵ About a quarter of the Soviet oil production is exported to CMEA and Western Europe, the latter exports contributing almost 45 % of the Soviet hard currency earnings.⁵⁶ Exports to the CMEA countries and Western Europe were reduced, however, by 20-25 % in 1981.⁵⁷ Roumania still produces 1 % of the world's total oil production.⁵⁸

Although at this time it is still the Soviet policy to rely almost exclusively on domestic production, many analysts believe that with dwindling domestic resources, rising consumption, and difficulties in obtaining appropriate technology to develop new deposits, the Soviet Union and its Warsaw Pact allies will sooner or later confront a serious energy crisis forcing the Soviets to search for energy sources abroad. Implications of such a development will be explored later in this study (Part II. 3).

Part II. Resource War Concerns

1. In General.

Western dependency upon supplies of vital strategic raw materials from unstable regions of the Third World, and especially the Persian Gulf and southern Africa, combined with the penetration of some states in those areas by Soviet influence, has raised fears in the West that the Soviet Union has embarked upon the strategy of a "resource war" designed to deny the West access to such materials in the Third World.⁵⁹ However, there is no consensus regarding the reality of this "resource war." Without denying the possibility of a Soviet threat in the future, some analysts consider the specter of such "war" as an overblown bal-lyhoo stemming either from lack of correct information or politically inspired to provide the U.S. Administration with a rationale for confrontational policy or economically motivated by interests of the strategic minerals lobby in the United States.⁶⁰

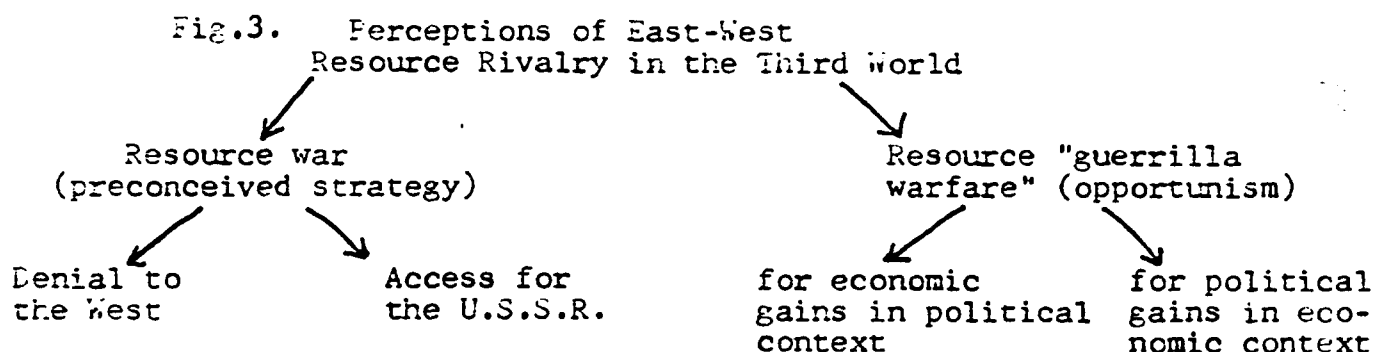
The idea of denying a potential or actual enemy access to vital raw materials is, of course, not new. Control and acquisition of such materials has always been a primary objective of states throughout history and assumed even greater importance with the onset of industrialization as a result of which the modern nation-states required large amounts of ever new and more exotic minerals and materials to sustain their expanding economies and keep up with the technological progress. The two World Wars witnessed attempts by both sides to complement their military operations by waging an economic warfare (blockade, preemptive buying, blacklisting) against the enemy, designed to hold or conquer strategic materials or to deprive the enemy of such resources vitally needed for the continuation of the war.⁶¹ Following the Second World War denial to the potential enemy of vital economic resources featured prominently in the Western Alliance's confrontation against the Soviet Union. Later on, with a certain reduction of tension in the Cold War it was hoped that strategic considerations of economic warfare could give way to a gradual evolution of more normal trade between the technologically superior West and the mineral-rich Soviet Union. Recently, however, as the relations between the United States and the Soviet Union deteriorated again, the strategic geopolitical thinking has reemerged as an important element in the reassessment of the United States' defense posture. As part of this thinking, the United States' defense is perceived to be threatened by dependence on imports of strategic materials from regions vulnerable to the Soviet strategy of a "resource war". Memories of the 1973-74 oil embargo, along with the growing concern about the depletion of domestic mineral resources and the campaign of the strategic minerals lobby for development of such resources⁶² have all further strengthened the appeal that the idea of this kind of "war" has had with the concerned public.⁶³ It is interesting to note here that the "resource war" issue has been publicized much more in the United States than in Western Europe which is otherwise much more vulnerable to any Soviet strategy of denying access to strategic minerals.⁶⁴

The terms "resource war" and "resource confrontation" have been used rather loosely in the debate carried on by political and military analysts, mining experts, journalists, congressmen, and other public figures.⁶⁵ One definition of the "resource war" views it as "...the acquisition of vital resources by noneconomic means, while at the same time it is a pernicious form of 'economic cannibalism', designed to destroy the process of economic activity outside the Soviet bloc... [It is] a strategy of confrontation that extends beyond economic competition, but which falls just short of conventional military conflict."⁶⁶ Thus defined, the resource war, perceived to be waged by the Soviet Union and some of its allies, is a foreign policy strategy which includes all kinds of rather insidious methods used to gain control of the Third World's strategic resources. It discards conventional practices of international trade, resorting to basically political techniques, but not to the use of military force, to achieve its objectives; it is "low-cost, low-casualty, low-visibility and usually below the threshold of the effective response by the North Atlantic Treaty Organization"⁶⁷ On the other hand, some other analysts include military disruption and denial of strategic materials to the West by force of arms within the concept of the resource war.⁶⁸

All these and other perceptions and interpretations of the resource war indicate a variety of concerns ranging from the fear of an outright Soviet military takeover of a source of strategic materials to concern about Soviet economic activities ostensibly within the boundaries of conventional state practice but in reality concealing their true resource war nature. Therefore, like other vague and ambiguous concepts used in political parlance, the concept of the resource war must be concretized by a more detailed analysis of its actual or potential manifestations.

A number of typologies classifying various resource war or confrontation concerns and their interpretations can be devised for analytical purposes. One obvious distinction, which is frequently blurred in the debate, is between the actual Soviet (including some of its Warsaw Pact allies and overseas client states) behavior and the Soviet capability to act. In another typology Soviet activities could be perceived either as implemen-

tation of a coherent and preconceived strategy or as a product of haphazard and opportunistic expediency. One perceptive analyst of fears harbored about the Soviet designs⁶⁹ makes further distinctions within the two types of concern. The former, deliberate behavior could be indicative either of a denial strategy, designed to interrupt or cut off supplies of strategic resources to the West as part of a more general plan for an offensive against the West, or an access strategy prompted by the need to supplement diminishing Soviet supplies in competition with the Western industrialized nations. The latter, opportunistic type of behavior could aim either at commercial, economic gains flowing from unstable political situations in the Third World, deliberately created by the Soviet Union, or at political gains deriving from economic circumstances and grievances of the Third World countries. A third typology⁷⁰ groups the resource rivalry concerns in three types: 1. economic concerns - corresponding to fears of a Soviet access strategy; 2. strategic concerns - corresponding to fears of a Soviet denial strategy; and 3. mixed concerns which perceive danger in Soviet activities in the Third World, designed to gain access to resources by non-economic methods, such as intimidation or subversion. This category roughly corresponds to the economic opportunism type of behavior of the second typology. Within each typology, concerns about the Soviet strategic resources activities in the Third World need not be mutually exclusive. For example, observers concerned about the Soviet denial strategy may, and often do, believe that the Soviet Union is simultaneously pursuing the goal of securing for itself access to Third World strategic materials. Also specific types of events, for example the formation of a chrome cartel in southern Africa can be interpreted as reflecting any of the concerns. In temporal perspective one kind of Soviet activities may reflect an expediential taking advantage of an economic opportunity, but at the same time cumulatively such activities may lead to a full-fledged resource war denial or access strategy. The analysis that follows will deal with perceptions of the East-West resource rivalry in the Third World according to the framework illustrated by the following Figure:



2. Fears of a Soviet Denial Strategy.

Those convinced of the reality of a deliberate Soviet denial strategy are very much impressed by the relative vulnerability of the Western strategic materials posture and concerned about the Soviet political and military penetration of regions critical to Western security, including primarily the Persian Gulf and southern Africa, but also Latin America.⁷¹ Of particular concern is the fact that the Soviet Union is the West's major alternative supplier of important strategic minerals produced in southern Africa (Part I 3). In implementing its denial strategy the Soviet Union is perceived to use a mix of military, political, diplomatic, and economic tools. A number of variations on this theme are suggested by alarmed observers.

The worst case scenario whereby the Soviet Union would resort to military force to deny the West strategic materials in the Third World either by invasion and occupation or by destruction of production and transportation facilities is held highly unlikely by most analysts.⁷² It is almost certain that a Soviet military action of this kind would escalate into a general armed conflict between NATO and Warsaw Treaty Organization. Therefore should it happen at all, it would unfold within the context of wide-scale hostilities which would dwarf the secondary theater in the Third World strategic resource areas.

At this point in the discussion the Soviet military intervention in Afghanistan may appear to some as a case of an actual use of force by the Soviet Union, motivated at least partially by the desire to ensure Soviet access to mineral resources, in this case natural gas and perhaps some non-fuel strategic materials.⁷³ However, the decision to intervene was influenced by more weighty considerations, such as the existence of a Marxist regime in Afghanistan and -the crucial factor- the geographical contiguity of that country to its Soviet neighbor. Another, more common geopolitical interpretation of the

Soviet military intervention in Afghanistan, perceives it as a stepping stone to the control of the Gulf oil, which would allow the Soviet Union blackmail and eventually "Finlandize" Western Europe without necessarily provoking a major military conflict.

The question whether the Soviet Union would at present have capability to seize mineral producing areas of southern Africa goes beyond the scope of this study, but it appears that logistical problems and resistance by South African armed forces would be among factors making this kind of operation extremely difficult if not impossible. Interdiction of sea lanes by forceful interference with shipping is considered an act of aggression⁷⁴ and any Soviet attempt to interdict supplies along the Cape route in the Indian and Atlantic Oceans and elsewhere would lead to a general conflict.⁷⁵ It is obvious, however, that in the case of a global war the Soviet Union would try to interdict the sea lanes used by the Western Allies as supply lines from the Third World, but the North Atlantic route would be the main theater of naval operations.⁷⁶

Although large scale military intervention by the Soviet Union is not held likely, observers point to the potential threat posed by the military presence of the Soviet Union and some of its allies in regions critical for the Western supply security. The case of the two incursions from Angola into the cobalt-rich Zairian province of Katanga (Shaba) by Katangese rebels reportedly trained and equipped by East Germans and Cubans is quoted to show that although the Soviet Union is cautious enough not to embark upon direct military intervention by itself it can still engage in such operations through its proxies, below the threshold of a global confrontation.⁷⁷

Irrespective of whether or not the Soviet military activities in the Third World represent a conscious Soviet effort to prepare ground for winning the resource war, the fact remains that the Soviet Union has established military presence in some Third World regions, and especially in Africa where until the outbreak of the Angolan civil war in 1974 its involvement was minimal.⁷⁸ In 1983 the total number of the Soviet military personnel in Africa

was estimated at 6,800⁷⁹. Without counting the Soviet forces in Afghanistan and military personnel in areas not vital from the point of view of strategic materials, in 1983 there were Soviet contingents in Iraq (2,000), Syria (7,000), North Yemen (500), and South Yemen (1,500).⁸⁰ Among the Soviet satellites, the German Democratic Republic has traditionally served Soviet interests by its military presence overseas: 1,875 in Africa⁸¹ and 445 in the Middle East.⁸² However, it is the Cuban "surrogate" forces that have played a major role in Africa on behalf of the Soviet Union, with 25,000 troops in Angola, involved in the civil war there and 11,000 in Ethiopia, helping the government in fighting the Eritrean secession and the Somalis in Ogaden.⁸³ Apart from Nicaragua and the now closed Grenada chapter, in 1983 other Cuban contingents abroad included 750 troops in Mozambique, 750 in Congo, 500 in other African countries, and 300 in South Yemen.⁸⁴ Another aspect of the Soviet military presence in Africa has been the Soviet arms transfers to nations and liberation movements in the region as well as training and advising activities. As a result, the Soviet Union has emerged as the major supplier of arms in Africa, the bulk of supplies being concentrated in a few key countries.⁸⁵ All these cases of the Soviet military presence in the Third World are underplayed by the Soviet Union which contends that such presence is maintained in a very few countries and is limited to a small number of service men who are only military advisors.⁸⁶

The Soviet Union has also increasingly used its navy and air force to project power overseas. It has maintained naval presence in West Africa since 1968⁸⁷ and off Angola since the mid-1970s.⁸⁸ Soviet naval units use facilities on Dahlak Island, Ethiopia³⁹ and, following the eviction of the Soviets from Berbera, Somalia, in 1977, Aden and Sokotra have become important for the Soviet Union by providing naval facilities on the way between the Straits of Hormuz and southern Africa.⁹⁰ It must be borne in mind, however, that facilities involve only docking rights, repair, and the like, but are not permanent bases as understood in the United States. To that extent alarms about the Soviet naval threat to

the sea lanes around South Africa have been exaggerated.⁹¹ To complement the picture of the Warsaw Pact countries' military involvement overseas, one might add that some military links exist - in addition to the East German military personnel in Africa - between Mozambique and Angola on the one hand and Bulgaria and Romania on the other.⁹² No formal defense agreements exist, as far as it is known, between Warsaw Pact countries and any of the states in Latin America.⁹³

The above review shows that the Soviet Union, directly and through its proxies, has indeed established military presence in some of the most critical parts of the Third World. However, it is not clear to what extent this presence has resulted in increasing Soviet influence in the Third World. At any rate it has not made it possible for the Soviet Union to control the domestic and foreign policies of the countries involved, contrary to some analysts claim that "when you have the power of the gun, influence follows automatically."⁹⁴ In sum, the military "power projection" of the Soviet Union in the Third World has not, except for the brief and relatively harmless Suaba incident, adversely affected Western access to the needed strategic resources.

While stressing dangers inherent in the projection by the Soviet Union of its military power in Third World's resource rich areas, many observers are also voicing fears that the Soviet Union is implementing its denial strategy by combining military presence with a concerted application of diplomatic, political, and economic instruments, all designed to destabilize the target countries and eventually control their strategic resources. As part of these fears it is suggested by some alarmed analysts of the Soviet behavior that the Soviet Union is pursuing its denial strategy by supporting Marxist liberation movements in mineral-rich regions of southern Africa, exploiting civil disorders and regional hostilities, and even taking advantage of natural disasters.⁹⁵ The following discussion will analyze the credibility of these concerns, taking account of Soviet activities in the sensitive regions of southern Africa.

Since 1970s the Soviet Union has greatly increased diplomatic contacts with African countries⁹⁶ and concluded treaties of friendship and cooperation with the newly installed Marxist-Leninist type governments of Angola (1976), Mozambique (1977), and Ethiopia (1978).⁹⁷ Similar agreements were entered into with Iraq (1972, 1973), Syria (1930), and South Yemen (1979, 1983).⁹ Other members of the Warsaw pact have also signed treaties of this kind: Hungary with Ethiopia and Mozambique (1980) and Bulgaria and Roumania with Libya (1983).⁹⁹ In addition, Defense Ministers of Bulgaria and Hungary signed cooperation agreements with South Yemen (1980, 1981).¹⁰⁰ In connection with various technical aid projects (e.g. an oil refinery in Ethiopia and a bauxite mining complex in Guinea) the Soviet Union has signed technical cooperation agreements with many African countries, including agreements providing assistance in the exploration and exploitation of mineral resources of at least 11 countries.¹⁰¹ The Soviet Union and its allies have established similar cooperation and technical assistance programs with a number of Latin American countries, showing particular interest in bauxite producing states of the Caribbean.¹⁰²

Beyond this otherwise internationally acceptable behavior which illustrates Soviet desire to gain influence in the Third World it is difficult to obtain specific data corroborating fears that the Soviet Union is singlemindedly pursuing a systematic resource denial strategy in the mineral rich regions of southern Africa or elsewhere. The usual alarmist argument is that the Marxist regimes of Angola, Mozambique, eventually Namibia and - in the most alarmist scenario-even South Africa, in concert with the Soviet Union, are likely to jeopardize the West's access to their foreign sources of supply.¹⁰³ There are several flaws in this argument apart from the fact that the Soviet Union has not had, on a global scale, a large number of political successes in the Third World (some were successes by default) and has even suffered serious setbacks (China, Indonesia, Egypt, Sudan, Somalia). First, the question of the Soviet singleminded motivation for a resource war must be raised. It

is not the purpose of this study to analyze in detail the cases of Soviet intervention in Africa, but one can state in general that the Soviet behavior in these cases did not exhibit features of a preconceived and coherent strategy. On the contrary, as noted by a perceptive analyst of Soviet affairs, it was "tentative, jerry-built, marked by fits and starts, and at times distinctly confused."¹⁰⁴ One might also add that the events leading to Soviet intervention were not Soviet-inspired but originated in basically native African situations. Second, even if the Soviet Union were bent on pursuing a denial strategy, it is doubtful that even a Marxist-Leninist but highly nationalist regime, certainly not -as suggested by some-¹⁰⁵ subservient to the Soviet Union, would support Soviet foreign policy objectives by agreeing to interrupt the flow of mineral exports to the West. Third, as noted by knowledgeable observers,¹⁰⁶ however radical the leadership of a Third World country might be, it could not afford losing the badly needed hard currency revenue from exports of minerals on which very often its economy depended. As a matter of fact it can be argued that the more radical a Marxist regime would be, the stronger motivation it would have to expand exports in order to finance the growing social expenditures and obtain hard currency needed to acquire Western technology and capital resources.¹⁰⁷ The actual experience of the Marxist regime of Angola confirms this argument. It is common knowledge that not only has it not denied the West access to its resources but has promoted Western investment in its oil fields, the Cuban troops protecting the Gulf installations of Cabinda against local insurgents.¹⁰⁸

Apart from its ultimate irony of a Soviet proxy's military forces guarding "imperialist" investments in a "socialist" Soviet client state against a nationalist insurgency, the Cabinda case points to the most likely scenario for a cutoff of a strategic material: a short term interruption produced by political instability in the producing country.¹⁰⁹ For example, even without a Shaba-style invasion, Zaire's mining

operations could be interrupted by a terrorist attack. Political instability in South Africa would, in all probability, not be Soviet-instigated but attributable to the apartheid policy of the government.¹¹⁰ In other countries of southern Africa there are enough potentially destabilizing factors, such as tribal conflict, secessionist movements, labor unrest, or domestic political rivalry, to cause disruption without any Soviet intrigues. In the long run, unless a solution is found in South Africa, a major conflict will develop between the "front line" states, likely to be supported by the Soviet Union, and South Africa, which may result in more serious disruptions of supplies to the West. Another scenario envisions the Soviet Union participating in an interdiction of South Africa's shipments of strategic materials to the West under a United Nations Security Council enforcement measures.¹¹¹ Like the U.N. sanctions against the white minority regime of Southern Rhodesia,¹¹² this would cause a prolonged interruption of supplies. However, apart from the possibility of circumventing the sanctions,¹¹³ the Security Council's decision, to be legally enforceable, would have to be at least acquiesced with by the Western permanent members of the Council, something that does not appear likely in the foreseeable future.¹¹⁴ A Soviet-led blockade enforcing an anti-South African embargo without a Security Council authorization but with the support of an at least two third majority of the U.N. General Assembly is not a plausible proposition for at least two reasons. First, it would have to assume Soviet capability to carry out an effective blockade, which is not certain, and second, it would dangerously approach the threshold of bringing about a response by the United States and its allies, something that the Soviet Union is most cautious to eschew.

In view of the foregoing analysis of the Soviet behavior there seems to be little persuasive evidence to support the thesis of a deliberate resource war being waged by the Soviet Union against the Western industrialized nations in the Third World. However, the adherents of the resource war thesis claim to have supporting evidence not only in facts but also in the Soviet doctrine. They refer to various statements by Soviet leaders to the effect that

the road toward the ultimate victory over imperialism leads through an indirect assault on the West's Achilles' heel, that is, its dependence upon supplies of raw materials from the colonial territories, now enlarged into the wider concept of the Third World.¹¹⁵ "Sever the raw materials from the colonialists" argued Lenin, "and you cut the spinal cord of the Empire."¹¹⁶ Similar statements are produced from the writings of Stalin,¹¹⁷ Khrushchov,¹¹⁸ and Brezhnev.¹¹⁹ References are also made to statements by Soviet defectors,¹²⁰ a Soviet general,¹²¹ and even Andrey Sakharov.¹²² To what extent can the Soviet leaders' pronouncements be taken seriously as evidence of the fact that the Soviet Union is indeed engaged in a resource war against the West? There is nothing unusual in this rhetoric since it is common knowledge that according to the ideology motivating the Soviet leaders their Marxist-Leninist state is allowed to use all possible methods to accelerate the destruction of capitalism and secure a world victory for socialism. This ideological long-term objective, perhaps once taken seriously by Lenin as within the reach of the Soviet state, has, in the different technological, economic, and political context of today's world, receded into more and more distant future but still remains as part of the rhetorical lip service of Soviet ideology. To the extent therefore that it is the Soviets' goal to dominate the world it is also their objective to "gain control of the West's two great treasure houses", as put by Brezhnev. However, it would be unrealistic to assume that such maximization of a superpower's goals was possible in the conditions of today's international system. One cannot expect the very cautious Soviet leadership to maximize all its efforts in a singleminded and rational pursuit of a policy which, if logically followed, would-be bound to end in a dangerous confrontation with the West. Moreover, the resource war hypothesis assumes a monolithic foreign policy decision making system whereas even in the Soviet Union there exist differences among interest groups which may have conflicting perceptions of priorities to be pursued in foreign affairs. The theory that the Soviet Union has decided to engage in a resource war, driven by economic necessity, raises different problems to be discussed in the following paragraphs.

3. Fears of a Soviet Access Strategy.

Without necessarily excusing the Soviet Union of designs related to the denial strategy, proponents of what might be called the "access theory" interpretation of the Soviet behavior¹²³ focus on the economic reasons for the resource rivalry in the Third World. They contend that the Soviet Union finds itself in a transition stage from mineral self-sufficiency to mineral dependency, as a result of which it is driven to pursue a strategy of access to Third World's sources of strategic materials in order to meet its domestic demand. Emphasis upon this economic element of fundamental national importance makes the access hypothesis appear much more sinister than the denial strategy since it implies that in the long term a most vital Soviet interest is at stake and not just the weakening or eventual destruction of the capitalist world which -at least in theory - is doomed in any case. Pointing to some recent changes in the Soviet import-export pattern (see Part I 4), some analysts believe that from an exporter of strategic materials the Soviet Union is becoming an importer, a pattern of trade that in the most alarming view is taken to be not just a passing phenomenon but the beginning of a historic shift.¹²⁴ Two reasons are usually offered to account for this trend; that the Soviet Union is running out of its reserves or that for the sake of economic efficiency it is "moving toward a policy of selective and strategic dependency on foreign resources"¹²⁵ as an alternative to the very difficult and costly exploration and exploitation of domestic lower grade ores in the forbidding environment of the Soviet Arctic. A major implication of this policy is believed to be a growing Soviet involvement in competition for resources in the Third World. This is perceived by some observers to have a great potential for conflict as the Soviet Union, suffering from an endemic shortage of hard currency, will increasingly resort to non-conventional methods of acquiring the needed strategic resources, ranging from barter, including arms deliveries, to political intimidation and, in general, "imperial" rather than commercial techniques of foreign trade.¹²⁶

To what extent do these fears square with the facts? As revealed

by the examination of the Soviet strategic materials posture (Part I 4), there is some evidence of a shift in the Soviet foreign trade toward reducing exports of some strategic minerals (e.g. titanium, nickel, platinum) and importing minerals with respect of which the Soviet Union has traditionally been self-sufficient (cobalt from Zaire and Zambia, chrome from Albania and Iran, manganese from Gabon, and some other minerals). Yet there is no definitive evidence that this is a "historic" turnover in the Soviet trade pattern resulting from any lack of proven or potential reserves.¹²⁷ Rather it is a temporary and selective shift for a period until new productive capacities have been completed in Siberia, perhaps some time in the 1980s.¹²⁸ With its great potential of exploitable reserves, the Soviet Union will do everything possible to maintain in the long run its traditional policy of self-sufficiency,¹²⁹ but in the meantime, with the prices of strategic minerals remaining relatively low, economic rationality makes it more advantageous for the Soviet Union to resort to selective imports. Therefore there is no doubt that in this sense the Soviet Union has indeed entered international competition for some strategic materials but, at least for now, this fact does not warrant the claim that a resource war has begun between the East and the West.¹³⁰ One must also bear in mind that if the market in strategic materials tightens, competition among NATO countries themselves may become an equally serious problem for the West as the competition with the Soviet Union and its allies.¹³¹

As far as the alarms about Soviet resort to unconventional trade methods are concerned, it is quite reasonable to expect that the Soviet Union, facing hard currency difficulties, will tend to resort to trade in soft currency and barter in transactions with its suppliers. This may create some problems for Western importers of strategic materials since a centrally planned economy has in this respect a competitive advantage over its capitalist rivals, especially in dealings with those Third World countries in which natural resources are under state ownership or control. On the other hand, as already noted (Part II 2),

the pragmatic and strongly nationalistic Third World supplier states, including those following the Marxist or other socialist ideology, do not appear as likely candidates for becoming Soviet captives in any strategic resources rivalry between the Soviet Union and the Western industrialized world.

However vital the supplies of non-fuel strategic minerals from southern Africa may be for the West, much more attention among resource and Soviet analysts has focused on the question of the equally vital oil supply from the Persian Gulf. The major concern has been the possibility of a Soviet attempt to gain control of this area either by military action or otherwise in order to secure for the Soviet Union supplies of energy to complement the dwindling domestic resources.¹³² As already discussed (Part I 4), the state of the Soviet energy resources is a controversial question, the estimates of the Soviet oil reserves ranging from the pessimistic projections of the CIA to the more optimistic recent estimates to the effect that in the 1980s the Soviet Union and the Warsaw Pact as a block will be in a better position than NATO in terms of access to energy natural resources although NATO will have the advantage in energy technology and capacity to pay for imports and capital development.¹³³ Although the Soviet Union is not likely to face an immediate energy crisis, its energy supply is not entirely assured.¹³⁴ In one estimate, should the Soviet oil production fall below 10 million barrels a day, the Soviet Union will no longer be able to export oil to the West, having to supply oil to its Eastern European allies whose economies it cannot allow to collapse.¹³⁵ In this situation it will have to enter the world oil market and compete with other oil importers. At this time the Soviet Union can still obtain oil by normal economic means, as much as possible using barter for arms and economic cooperation agreements to save hard currency reserves. However, most experts agree that if a serious energy crisis develops, it will not be able to spend some 40 to 60 billion dollars to pay for the needed imports. It is such a situation that causes concern of security analysts, some of whom fear that the Soviet Union will be compelled to think of a strategy designed to

obtain control of the Persian Gulf oil resources. There is virtual consensus among analysts that only in a most desperate situation would the Soviet leaders be tempted to resort to the military option.¹³⁶ Confronted with the choice between spending enormous sums to pay for imports and a very serious risk of a direct confrontation with the West, the Soviet Union would be likely to opt for an intermediate strategy of a less obvious power play. Against the background of veiled threats of military intervention it would use all kinds of economic and political tools to force for itself access to the Gulf oil: pressuring oil producing states to accept rubles or barter agreements; competing on a non-commercial basis with Western shipping companies by offering Gulf producers cheap state-controlled rates; destabilizing and subverting the region; and the like.¹³⁷

The Western nations would also face a dilemma in the case of a serious Soviet energy crisis.¹³⁸ Should they offer the Soviet Union their technology in order to help it develop its oil fields and thus defuse the Soviet pressures on the world oil market and perhaps even forestall a Soviet move against the Gulf? If the West does provide such technological and financial assistance it will strengthen the Soviet position and perhaps even encourage a more aggressive Soviet policy. On the other hand, should the West refuse such aid, it might drive the Soviet Union to take risks which it would otherwise prefer not to take.

All these considerations deal with scenarios which are not very likely in the near future. Like in southern Africa, more plausible threats to the West's access to energy sources in the Gulf would come from political instability and regional conflicts rather than from outside the region. The discussion of these problems, however, does not come within the scope of this study. Still one must remember that regional troubles can be opportunistically exploited by the Soviet Union for its own economic and political gains, as discussed in the next section.

4. Soviet Economic and Political Opportunism

Whereas those analysts who assert the existence of a resource war assume that the Soviet Union is deliberately implementing

a denial or/and access strategy, others do not perceive any signs of a purposive and orchestrated policy behind the Soviet behavior in the areas of the Third World where a resource confrontation may take place. They see the Soviet Union only as making most of opportunities afforded by the political and economic environment in the Third World, to make commercial and political gains and reduce the influence of the West.¹³⁹ One excellent opportunity for the Soviet Union to get an economic windfall out of a political situation was the Arab oil embargo of 1973-74. The Soviet Union did everything to induce the Arab oil exporting countries to declare an embargo and exhorted them to the continued use of this economic weapon. However, without any scruples it sold its oil to the Netherlands and the United States, the main targets of the Arab embargo, and even resold quantities of Iraqi oil, antagonizing the Arabs in the process but cynically denying any duplicity of its behavior.¹⁴⁰ In the area of strategic non-fuel minerals two examples of how the Soviet Union can exploit political trouble for its own commercial gain are usually quoted. The first case concerns the Rhodesian chrome, bought by the Soviet Union from Southern Rhodesia in violation of the U.N. sanctions and subsequently dumped on the world market,¹⁴¹ and the other is the Soviet purchase of a two-year supply of Zairian cobalt on the eve of the second Shaba invasion in 1978 and subsequent resale with a 300 % profit. Since the invasion is believed to have been inspired by the Soviet Union, this purchase can be interpreted as stockpiling with the benefit of inside knowledge.¹⁴² Although these two examples of Soviet manipulation should not be exaggerated since they did not have any lasting effect upon the supply or prices of the two minerals,¹⁴³ they point to the possibilities that may exist for the Soviet Union in this kind of operation. Opportunities would also arise for the Soviet Union in case of political turmoil in mineral producing countries of southern Africa with the resulting interruption of exports. Since the Soviet Union is a major alternative producer of a number of strategic minerals found in the region, it could boost its position as exporter and reap a rich profit on the value of its exports.¹⁴⁴

As a result of the oil price increases under the aegis of OPEC, some analysts have voiced concern about the potential dangers inherent in a possible creation of cartels in strategic materials, such as chromium, platinum, cobalt, etc. of which the Soviet Union and southern African countries are the leading producers. The most ominous scenario envisions a group of Marxist states of southern Africa brought by the Soviet Union into the CMEA, thus offering the Soviets a mechanism for creating a supercartel to control a major portion of the world's strategic minerals. Fortunately for the West this frightening scenario does not appear plausible at the present time. Even today the creation of an OPEC-style cartel in a strategic mineral would not be easy.¹⁴⁶ Countries such as Zambia or Gabon, in debt to Western lenders, are in a desperate need for hard currency and would not risk serious damage to their economy by engaging in a cartel. Furthermore, the success of a cartel would depend on a number of factors, such as the geographical dispersion of the exporters, their political systems, possibilities of substitution, and primarily the cohesion of the cartel's members. All these factors do not, at present, favor the idea of a strategic mineral cartel, reducing thereby any Soviet chances of reaping windfall economic benefits from this type of organization. Of course, cartelization attempts by producers of strategic materials would also, as a rule, be abetted by the Soviet Union for political reasons as well as for economic gain.

In general, even those observers who are skeptical of the existence of a resource war agree¹⁴⁷ that the most credible Soviet threat to the West in the area of the Third World's strategic minerals is Soviet political opportunism, that is, exploiting for political gain the economic plight of the Third World nations and their grievances voiced within the context of their demands for a New International Economic Order.

Part III. Conclusions and Policy Implications

1. Conclusions.

Although a definite conclusion regarding the resource rivalry in the Third World would depend upon a correct interpretation of the Soviet moves and motivations, a sober analysis of the relevant

facts and circumstances shows that, at least for the present, the Soviet Union is not posing a direct threat to the West's supplies of critical strategic materials in the Third World's two crucial regions, southern Africa and the Persian Gulf. Therefore fears of an impending or even existing resource war are exaggerated and perhaps misleading since by overemphasizing the Soviet threat they do not place the problem of the West's access to strategic resources in a more realistic overall perspective of the political and economic situation of the regions involved.

The Soviet leadership would undoubtedly relish the thought of controlling the strategic resources of the Third World. Such an objective fits with the Marxist-Leninist doctrine and strategy of an all-out struggle against imperialism. In reality, however, there is no clear evidence to support the thesis that the Soviet Union is pursuing a denial or access strategy in implementation of a concerted and preconceived master plan against the West. A Soviet forceful action to cut off exports to the West is highly unlikely since it would provoke a major conflict, something that the Soviet Union certainly does not wish to happen. Other methods of gaining control of strategic resources in the Third World could succeed only if Soviet control of such resources suited the respective national interests of the producing states. However, these states look to the West rather than to the Soviet Union for hard currency and technology needed in their development plans. Yet political and economic problems, endemic in the Third World countries, will continue to provide the Soviet Union plenty of opportunity to weaken the strategic position of the West and occasionally to gain economic windfall benefits from transactions in strategic materials. Basically, however, it is domestic and regional instability in the Third World rather than Soviet aggressiveness that appears as the more likely threat to the interests of the Western industrialized nations in resource rich regions of the world.

The conclusion discounting the existence of a resource war must be tempered by taking into account the possible impact of certain recent trends in the Soviet export-import pattern, related perhaps

to Soviet concern about diminishing domestic reserves of some critical materials, including oil. If the shift from self-sufficiency to import of certain minerals should continue, the new Soviet posture would entail a more active engagement in southern Africa's mineral trade with the concomitant increase in resource rivalry and more aggressive attempts to obtain the needed minerals by methods transcending the traditional channels of foreign trade. In addition, a possible Soviet energy crisis would generate similar Soviet pressures in the oil rich region of the Persian Gulf, with the military option only a remote possibility in a most desperate energy crisis situation.

The future course of the Soviet behavior is likely to be largely determined by the rate at which the production capacity of new investments will be able to relieve pressures to look for strategic resources in southern Africa and the Gulf. Should the Soviet strategic resources situation improve considerably, the Soviet Union might use its favorable position in the world market as a weapon against a Western country which developed a critical dependency for the supply of a strategic material from the Soviet Union and thus became vulnerable to Soviet manipulation and power play.¹⁴⁸

2. Policy Implications.

Despite the conclusion that there is no clear and present Soviet danger to the West's supply of strategic resources in the Third World there is need for a concerted Western strategic resources policy based on a more rational and refined analysis of the Soviet behavior, intentions, and capabilities, especially since the Soviet involvement in the Third World is basically antagonistic to the West in any case. Moreover, since the more likely threats would arise from situations unrelated to the East-West confrontation, the Western policy must comprehensively deal with all kinds of challenges to the availability of strategic materials in the Third World, whatever their causes and circumstances. The ultimate objective of such policy must be not only to neutralize any Soviet attempts to manipulate strategic resources situations in the Third World but also to reduce as much as possible the import dependency of the Western world as a whole.¹⁴⁹ The

overall Western strategy must include two kinds of measures: defensive measures to offset possible adverse effects of short to medium-term interruptions of shipments of strategic materials and long-term measures designed to prevent such interruptions in the first place. These two directions of Western strategy will be discussed in the following paragraphs.

Establishment of strategic stockpiles is recognized as the most appropriate strategy among the first kind of measures.¹⁵⁰ The United States has had an extensive stockpile system since 1939.¹⁵¹ Some 93 materials are included in this strategic and critical materials stockpile which is designed to be sufficient for an at least three-year emergency, but in most cases does not meet the stated targets.¹⁵² Stock can be released only on President's order for purposes of national defense in case of war or another national emergency, but not in case of interruptions which, as discussed in this study, are most likely in the Third World. Although the U.S. stockpile system has been criticized as inadequate, inefficient, too cumbersome, and subject to manipulation for non-defense political purposes,¹⁵³ the United States is the only NATO country to maintain a sizable stockpile. However, since the U.S. system is not suitable as a security against non-war time interruptions it has been suggested that an alternative decentralized but government-subsidized system of stockpiling which already exists de facto be set up by legislation.¹⁵⁴ The stockpile systems of U.S. allies are relatively new and very small. The French system, in existence since 1975, provides for emergency supplies during disruptions lasting no longer than four months. Four months and possibly a whole year is the period provided for the West German system. Italy and Spain have also been considering setting up stockpiles of strategic materials. Great Britain, whose capital is the center of the world's mineral trade, has so far not developed any program of stockpiling. Japan's policy has been not to rely on stockpiling but to diversify its sources of supply. The chances are, however, that recognizing Japan's vulnerability, its government will develop a stockpile program in the near future.¹⁵⁵ Generally speaking from the Western Alliance perspec-

tive the U.S. allies should upgrade their stockpiling programs and the stockpile policy of NATO and Japan should be coordinated and periodically reviewed.

Measures of a basically technical nature that must be undertaken to reduce import dependency include substitution,¹⁵⁶ conservation, including improved design,¹⁵⁷ and resource recovery and recycling.¹⁵⁸ Substitution involves not only simple replacement of one material with another but also replacement of one process with another or changing the fundamental characteristics of a material or part.¹⁵⁹ There is great substitution potential for many critical materials, especially in non-essential application, including the eight ultra-strategic materials, listed in this study (Part I 3).¹⁶⁰ However, there exists no satisfactory substitute for manganese in its major application, that is , the production of steel; for tantalum in its critical use in jet engines; for titanium in aircraft and space use; and for chromium in certain kinds of application.¹⁶¹ Conservation can achieve a more efficient use of resources by minimizing losses in production processes, improved design, and matching materials capabilities to uses, for example. Recycling strategic materials is of less importance as an approach to reducing import dependency.¹⁶²

In addition to the above listed technical countermeasures, there are options of economic and political nature available to the Western Allies. One major policy option which, however, is in practice available only to the United States, Canada, and Australia, is to improve the domestic supply of strategic materials by increasing exploration and development of deposits at home. In the United States this would require reviewing regulations which exclude public lands ("wilderness areas") from mineral exploration and development activities,¹⁶³ a well known sensitive and controversial issue because of its environmental implications. The programs of strategic resource development should be coordinated among the allies in order to avoid duplication of effort. They should strive to achieve a judicious balance between legitimate security needs and sound environ-

mental considerations. In the long run, in view of the fact that import dependency will remain a permanent feature of the Western strategic materials posture, diversification of the sources of supply, with emphasis on more and secure sources, should be a crucial objective in the Western strategic minerals policy. Such diversification, already a traditional policy of Western Europe and Japan, has also been achieved by the United States in the case of some minerals (bauxite/aluminum, cadmium, mercury, and tungsten, for example). Unfortunately the strategy of diversification has its limitations because of the geographical concentration of three vital strategic materials, chromium, cobalt, and platinum group metals in southern Africa, with the Soviet Union being a major alternative. Finally, the deep sea bed mining of manganese nodules offers an almost inexhaustible potential of supplies of vital strategic minerals: manganese, cobalt, nickel, copper, molybdenum, vanadium, and perhaps some other materials.¹⁶⁴ The technology of deep sea bed mining has already been developed, pioneered by U.S. companies, but commercial exploitation is not expected until some time in the 1990s. At least two reasons account for this delay: first, there are no economic pressures because of sufficient supplies from land sources and, second, the international legal status of the deep sea bed regime is still uncertain despite the adoption in the 1982 U.N. Convention on the Law of the Sea of the "common heritage of mankind" principle under which deep sea bed mining is to be managed by a special U.N. "International Sea-Bed Authority" for the benefit of all mankind but with preferential treatment of the developing countries.¹⁶⁵ Believing that this solution unduly discriminates against the developed nations, but also motivated by long-term strategic mineral needs, the United States Administration has so far refused to sign the Convention.¹⁶⁶ Since there are differences of opinion in this respect among the Western allies themselves, NATO must develop a common policy designed to secure the Western world the right of access to the strategic minerals available in the deep sea bed beyond national jurisdiction. The same policy should govern the Western nations in the current negotiations of the Antarctic Consultative powers on the regime

to govern the future exploration and exploitation of the Antarctic mineral resources, a potential source of oil and minerals some next century.¹⁶⁷

However essential all the above strategies for moderating the impact of any supply interruptions may be, in the long run they will prove insufficient unless the Western allies undertake, within a coordinated foreign policy framework, diplomatic, political, economic, and even military measures designed to forestall situations in the Third World which could be exploited by the Soviet Union for its own purposes. Both the United States and its allies have interest in assuring uninterrupted access to vital strategic materials, but the United States has had a tendency to emphasize more immediate military and strategic concerns while its European allies have been paying more attention to economic development in the Third World as the most effective long-term deterrent to counter possible Soviet threats. These two approaches should be combined in planning a balanced strategic minerals policy of the West. For example an effective Western military presence in the Persian Gulf and Indian Ocean area is essential but the military option, in principle politically unacceptable, must be considered only in the last resort. On the other hand, the very presence of a strong allied capability in those areas and the willingness to use it can prove a strong deterrent against any attempt to damage Western interests.¹⁶⁸ In planning their long range policy to secure access to strategic resources, the Allies should emphasize non-military instruments, all designed to strengthen the economic and political stability of the Third World's suppliers of such resources. This policy would entail developing ties with these countries on a pragmatic basis irrespective of their political systems. Increased diplomatic contacts and consultations, combined with economic and technical assistance, should be major elements of such strategy. More generally, the Western allies should show more support to the principles of the New International Economic Order,¹⁶⁹ especially since the Soviet Union has been exploiting the Third World's NIEO campaign for its own anti-Western propaganda without, incidentally, much concrete contribution to the Third World countries' development needs.

In terms of concrete international political issues no Western resource strategy will have a chance of long term success unless the major conflicts in the sensitive areas of the Middle East and southern Africa are brought under control. Specifically, as long as the Arab-Israeli conflict, including the issue of the Palestinians' self-determination, remains unresolved, the Soviet Union will have a better chance in any future resource confrontation in that part of the Third World. An analogous situation exists in southern Africa: as long as the Namibia issue is not settled and a decisive breakthrough is not achieved in South Africa's racial policy, the chances for Soviet political and economic opportunism will be increased. The policy implication is that the Western allies must make a concerted effort to help resolve the conflicts in the Middle East and southern Africa.

Generally, even though -as concluded in this study - there is no clear and present danger of a resource war in the Third World, the Western allies must develop a common strategy that would counter any Soviet moves in a possible future resource confrontation in sensitive regions of the Third World. By reducing their dependency upon imports of strategic materials from these regions and skillfully inhibiting Soviet opportunities the West will have an excellent chance of foiling Soviet attempts to wage, let alone win, a strategic resource war in the Third World.

Footnotes

1. North Atlantic Treaty, April 4, 1949, Art. 6. 63 Stat. 2241; TIAS 1964; 4 Bevans 828; 34 UNTS 243.
2. Among the most valuable contributions to this debate are:
 1. Harold Bullis, "The Resource War" in A Congressional Handbook on U.S. Materials Import Dependency/Vulnerability. Report to the Subcom. on Economic Stabilization of the Com. on Banking, Finance and Urban Affairs, House of Rep., 97th Cong., 1st sess., by the Congressional Research Service, Library of Congress, Washington: U.S. G.P.C. Sep. 1981; Robert Iervold, "The Strategic Implications of the Soviet Union's Nonfuel Mineral Resources Policy," Prepared Statement for U.S. Congress, House, Subcom. on Africa of the Com. on Foreign Affairs, Hearing: The Possibility of a Resource War in Southern Africa, 57-85. 97th Cong., 1st sess., July 8, 1981. Washington: U.S. G.P.O. 1981. William S. Mott, Prepared Statement, ibid. 8-37; Robert M. Price, Prepared Statement, ibid. 91-93; William K. Severin, Prepared Statement, ibid. 42-51; Michael Shafer, "Mineral Myths." Foreign Policy No. 47 (Summer 1982) 154-71; PBS -Nova, The Cobalt Blues. Boston: WGBH. PBS broadcast, Nov. 23, 1982; John D. Vellis, "Strategic Minerals: A US - USSR Resource War?" Joint Perspectives 2, no. 2 (Fall 1981): 68-81. See also: Frank R. Barnett, A New Strategy for the West. n.d. Reprint from Intima 30, no. 2; Alfred E. Eckes, Jr. The United States and the Global Struggle for Minerals. Austin, Texas: U. of Texas Press, 1979; Daniel E. Fine, "Strategic Minerals: Security of Supply and Resource Wars," St. Louis U. Public Law Forum 1 (1981):115-23; Id., "Mineral Resources Dependency Crisis: The Soviet Union and the United States," in James A. Miller, Daniel E. Fine, and P. Daniel McMichael, eds. The Resource War in 3 D-Dependency, Diplomacy, Defense. Pittsburgh: World Affairs Council, 1980; Thomas J. Houser; Rep. Jim Santini on the Resource War," Enterprise 4 (August 1980): 18-21; Galen Spencer Full, Fawns on a Chessboard: The Resource War in Southern Africa. Lanham, MD: The University Press of America, 1982; "Is There a Resource

War?" The Washington Post, Sep. 20, 1980, p. A18; Peter Janke, "The Soviet Strategy of Mineral Denial," Soviet Analyst 7, no. 22 (Nov. 1978):5-6; Herbert E. Meyer, "Russia's Sudden Reach for Raw Materials: Long an Exporter, the Soviet Union Is Now Competing with the West for Strategic Minerals," Fortune 102 (July 23, 1980): 43-44; Michael Morgan, "Minerals: Key to Soviet Current Strategies?" Defense and Foreign Affairs Digest 7, no. 12 (1979): 17-20; Friedemann Müller, The Problem of Raw Materials against the Background of East-West Relations. Bonn: Research Institute Friedrich Ebert Stiftung, 1982; Georgia Sambunaris, "Strategic Minerals and the Third World," Agenda 4 (July-Aug. 1981):11-15; Strategic Minerals: A Resource Crisis. Washington: Council on Economics and National Security, 1981 (A Project of the National Strategy Information Center); Sen. John W. Warner, Statement before the Subcom. on Energy and Mineral Resources of the Com. on Energy and Natural Resources, U.S. Sen., 97th Cong., 2d sess., Hearing on The President's National Materials and Minerals Program and Report to Congress 25-27. Washington: U.S.G.P.O., 1983.

Among comments in Europe see, e.g., E.W. Anderson, "The Need to Safeguard the Supply of Strategic Materials to the West," in Geoffrey Stewart-Smith, ed. Global Collective Security in the 1980's 67-79. Richmond, Surrey: Foreign Affairs Publishing Co Ltd, 1982; Alfred Coste-Floret, "The Great Design of the USSR in Africa: To Deprive the West of Its Vital Sources of Supply," Atlantic Community Quarterly 17, no. 3 (Fall 1979):270-78; Egidio Ortona, "The Threats to Vital Western Resources," Atlantic Community Quarterly 18, no. 2 (Summer 1980): 201-17.

3. Cf. the definition under U.S. law in the Strategic and Critical Materials Stock Piling Act, 1939, as amended, sec. 3(1), 50 U.S.C.93.

See also Bohdan C. Szuprowicz, How to Avoid Strategic Materials Shortages: Dealing with Cartels, Embargoes, and Supply Disruptions 1 New York: John Wiley & Sons, 1981.

4. See Szuprowicz (note 3) 2-4 and Fig. 1 in this study.

5. A Congressional Handbook (note 2) 344. The four criteria are further developed in this handbook in VA2. See also Sen. Warner (note 2) 26. Lech and Lye make a distinction between sensitivity and vulner-

- ability. An economy is sensitive (sensitivity being measured by import dependency) if it suffers adverse effects before countermeasures can be introduced to remedy the situation. An economy is vulnerable to the extent that it may suffer even after countermeasures, e.g. substitution, recycling, and the like, have been introduced. See Robert C. Keohane and Joseph S. Nye, Power and Interdependence: World Politics in Transition 12-17. Boston: Little Brown, 1977. For a typology of "vulnerability dependence" on imported materials: highly vulnerable supplies, relatively vulnerable supplies, relatively secure supplies, and secure supplies, see Helge Mveem, " Militarization of Nature: Conflict and Control over Strategic Resources and Some Implications for Peace Politics," Journal of Peace Research 16, no. 1 (1979)1, 12.
- c. A vulnerability index has been developed by the U.S. Army War College Strategic Studies Group for materials at least 50 % imported in mid-1970s. See Szuprowicz (note 3) 286.
 7. A German study of 1979 developed a quantitative raw materials political risk factor index ranging from 100 (low risk) to a high of 500 (high risk) for 15 minerals. Szuprowicz (note 3) 286 (Table 15.3).
 8. Anderson (note 2) 68 (Table 1). This attempt to quantify the strategic importance of minerals assigns quantitative values to a number of variables (substitution, depletion rate, scale of production, number of major sources, reliability of major sources, Warsaw Pact share of production), arriving at the strategic status of each mineral, resulting from the total of scores. The scores for "strategic" factors (the last three mentioned above) are multiplied by 2.
 9. See Szuprowicz (note 3) Chapter XV, with Table 15.1 including 24 critical danger point indications (p. 274) and Table 15.2 with 15 events and conditions conducive to a crisis (p. 281).
 10. Szuprowicz (note 3) 287.
 11. For a comprehensive survey of the energy, and especially oil, problems see Peter R. Odell, Oil and World Power. 7th ed. Harmondsworth, Middlesex: Penguin Books, Ltd., 1983; Daniel Yergin and Martin Millerbrand, eds. Global Insecurity: A Strategy for Energy and Economic Upheaval. Boston: Houghton Mifflin, 1982. For detailed studies of world energy outlook see, e.g., OECD, World Energy Outlook. Paris: OECD, Oct. 1982; Manfred Grothwohl, World Energy Supply. Berlin-New York: de

router, 1982.

12. For a thorough discussion see Szuprowicz (note 3); Phillip Crowson, Minerals Handbook 1982-83. London: Macmillan Publishers Ltd., 1982 (for the Royal Institute of International Affairs); James E. Nielke and L. Harold Bullis, Strategic and Critical Minerals. Boulder, Colorado: Westview Press, 1984.
13. See Fig. 1.
14. Based on data in 1983 Britannica Book of the Year 346. Chicago: Encyclopaedia Britannica, 1983.
15. Ibid.
16. See Table 5.1 in Szuprowicz (note 3) 94.
17. See U.S. Senate, Com. on Foreign Relations. 97th Cong., 2d sess. U.S. Minerals Dependence on South Africa. A Report. Washington: U.S.C.P.C., 1982. For a South African view see Statement by J.E. Clark, National Physical Research Laboratory, Council for Scientific and Industrial Research, Pretoria, South Africa, in U.S. Cong., House Com. on Science and Technology, 98th Cong., 1st sess. Seventh Biennial Conference on National Materials Policy: Report, March 1983. Washington: U.S.C.P.C., 1983., pp. 56-64.
18. Szuprowicz (note 3) 100-03.
19. 1983 Britannica Book of the Year (note 14) 346.
20. Szuprowicz (note 3) 105.
21. 1983 Britannica Book of the Year (note 14) 346, 347.
22. Szuprowicz (note 3) 180 (Table) See also Jorge A. Losada, "Strategic Metals: In the U.S. Backdoor," Latin American Times 4 (Jan. 1982): 23-25.
23. See "China Opens Alladin's Cave of Rare, Strategic Metals," Economist 279 (May 2, 1981): 73-74.
24. Szuprowicz (note 3) 114 (Table 6.1) and generally Ch. 6.
25. 1983 Britannica Book of the Year (note 14) 346.
26. A Congressional Handbook (note 2) 110.
27. It must be noted here that most analysts focus on the United States, neglecting its allies.
28. According to the risk index (note 7) the 15 most critical materials for West Germany are: chrome, manganese, asbestos, tungsten, cobalt, vanadium, titanium, platinum, aluminum, nickel, molybdenum, copper, tin, lead, and zinc. Szuprowicz (note 3) An official

- French study indicates France's vulnerability to supplies of 13 strategic materials, including copper, cobalt, tungsten, chrome, titanium, tin, lead, and zinc. Id. 228.
29. For a historical perspective of developments that contributed to U.S. import dependency see A Congressional Handbook (note 2) 13-17.
30. Id. 28.
31. For a detailed discussion of these 29 materials see id. 81-178.
32. The Strategic and Critical Materials Stock Piling Act, 1939, (note 3), sec. 3 (1).
33. A Congressional Handbook (note 2) 130. There are other vulnerability lists, but most of these eight minerals appear on them as well. See, e.g. the list of 11 minerals on the index of vulnerability prepared by the U.S. Army War College. Szuprowicz (note 3) 22 (Table 1.5). For various surveys see Amos A. Jordan and Robert A. Kilmarx, Strategic Minerals Dependence: The Stockpile Dilemma 20 and n.4. Beverly Hills, CA: Sage Publications, 1979 (The Washington Papers, vol. VII).
34. See A Congressional Handbook (note 2) 22 (Fig. 3).
35. For an examination of these three countries as U.S. suppliers of critical materials see U.S. Cong., House Com. on Interior and Insular Affairs, Subcom. on Mines and Mining, Sub-Sahara Africa: Its Role in Critical Mineral Needs of the Western World. 96th Cong., 2d sess., July 1980. Washington: U.S.C.P.O., 1980. This Report is summarized in A Congressional Handbook (note 2) 310-20.
36. A Congressional Handbook (note 2) 364.
37. Szuprowicz (note 3) 154-64. For Canada see also Jock Finlayson, "Canada and Strategic Materials," International Perspectives (Sep.-Oct. 1982): 13-21. For Australia see also: A Congressional Handbook (note 2) 362-63; M.R. Govett and G.J.S. Govett, "The Role of Australian Minerals Industry in World Minerals Supply," Resources Policy 6 (June 1980): 87-102.
38. 1983 Britannica Book of the Year (note 14) 346.
39. See Szuprowicz (note 3) 70-71.
40. For a survey of the Soviet bloc's apparent strategic materials self-sufficiency see id. Ch. 4. For the Soviet Union see also A Congressional Handbook (note 2) 170-73.

41. See Szuprowicz (note 3) 34 (Table 2.1).
42. In 1979 the Soviet Union was reported to be shopping for some of these materials, namely aluminum, copper, chromium, lead, titanium, and zinc (as well as molybdenum and cobalt). See A Congressional Handbook (note 2) 171, referring to "Soviet Union: The Mysterious Switch into Metals Buying," Business Week, May 21, 1979, p. 42.
43. A Congressional Handbook (note 2) 172.
44. Legvold (note 2) 72.
45. Severin (note 2) 43-44. Still in 1981 the output of chromite (the main ore of chromium) fell slightly. 1983 Britannica Book of the Year (note 14) 532.
46. Severin (note 2) 45-46. The Soviet supplies are augmented by cobalt contained in nickel ore imported from Cuba. Ibid.
47. In 1975 the platinum exports dropped off to only 1.4 million troy ounces from the peak level of 2.7 million annually in the years 1972-1974 but recovered gradually, reaching an estimated 3.35 million troy ounces in 1981. Severin (note 2) 44; 1983 Britannica Book of the Year (note 14) 533. Platinum group metals include platinum, iridium, palladium, osmium, rhodium, and ruthenium. Ibid.
48. In addition to the severe physical environment, these problems include long distances from processing and consuming centers, shortages of the necessary equipment, poor transportation infrastructure, and -last but not least- the perennial problem of the institutional inefficiency of the Soviet system. See A Congressional Handbook (note 2) 173.
49. Examples are Soviet purchases of manganese, chromite, and titanium. Legvold (note 2) 72.
50. Szuprowicz (note 3) 72 (Table 4.2).
51. 1983 Britannica Book of the Year (note 14) 532.
52. Szuprowicz (note 3) 78-79.
53. See Marshall I. Goldman, The Enigma of Soviet Petroleum: Half-Full or Half-Empty? London: George Allen & Unwin, 1980.

54. Among many studies of this problem the CIA Reports have received much publicity. Initially CIA projected that the Soviet Union and its East European allies would become significant annual net importers of oil by 1985. See Central Intelligence Agency, Prospects for Soviet Oil Production, ER 77-10270. Washington, April 1977. Subsequent CIA studies seemed to have revised upwards the dire predictions on the state of the Soviet petroleum reserves. See id. Prospects for Soviet Oil Production: A Supplemental Analysis, ER 77-10425. Washington, July 1977. For a thorough analysis of the Soviet petroleum problem see Goldman (note 53) (with an examination of the CIA reports at 5-10 and Ch. 6.) See also comprehensively Odell (note 11), Ch. 3; Joseph P. Riva, Jr., Soviet Oil Prospects. Washington: Congressional Research Service, April 6, 1981; and NATO Colloquium: CNEA: Energy 1980-90. Brussels: NATO, 1982; and the literature cited in note 134 below.
55. 1981 Britannica Book of the Year 352. Chicago: Encyclopaedia Britannica, 1981; 1982 Britannica Book of the Year 348. Chicago: Encyclopaedia Britannica, 1982; 1983 Britannica Book of the Year (note 14) 346.
56. Arthur J. Klinghoffer, "U.S. Foreign Policy and the Soviet Energy Predicament," Orbis 25, no. 3 (Fall 1981) 557, 563; Charles Ebinger (Project Director), The Critical Link: Energy and National Security in the 1980's. 195. Cambridge, MA: Ballinger, 1982.
57. Ebinger (note 56) 202.
58. Szuprowicz (note 3) 73 (Table 4.3).
59. For statements to this effect see, among others, Alexander Haig ("the era of the 'resource war' has arrived"), Statement before House Com. on Interior and Insular Affairs, 1980, Hearings on Resource War: Minerals Held Hostage, cited in Mott (note 2) 15; Warner (note 2) 25; Mott (note 2) 8; Barnett (note 2) n.p.; James A. Miller, Daniel E. Fine, and R. Daniel McMichael (note 2); Santini, in Houser (note 2) 18.
60. For a trenchant criticism of the resource war fears see Shafer (note 2). See also Severin (note 2); Price (note 2); and the two balanced analyses in Legvold (note 2) and Bullis (note 2).

61. For a historical review see David L. Gordon and Royden Dangerfield, The Hidden Weapon: The Story of Economic Warfare. New York: Harper & Row, 1947.
62. See Jerry Knight and Peter Behr, "Strategic Minerals Acquire New Prominence in U.S." Washington Post, reprinted in The Guardian, April 5, 1981, p. 17; PBS-Nova (note 2) 11, 15.
63. Continual legislative work in the U.S. Congress, which culminated in the passage of the National Materials and Minerals Policy, Research and Development Act of 1980 also promoted wide interest in strategic materials among the technical, industrial, and academic communities. See A Congressional Handbook (note 2) 165. A history of legislative activities and efforts of various national commissions, executive branches of U.S. Government, and professional societies are summarized in this Handbook at II B & C.
64. Among the few examinations of the problem see Anderson (note 2); Coste-Floret (note 2); and Ortona (note 2). European concern about the supply of strategic materials was also expressed in a report to the European Parliament, prepared by its Public Affairs Committee, which called upon the member states to take coordinated steps to safeguard the security of sea lanes, especially from the Persian Gulf and southern Africa. See Foreign Affairs Research Institute, "The European Parliament Demands Security of Se lanes," [mimeo] London 21/1980. The relatively low concern with the "resource war" issue in Western Europe does not mean that the European nations underestimate the problem of their strategic resources supplies, but may simply reflect the fact of their long living with the need to import most of the strategic materials from overseas.
65. Even the "moral majority" leader Jerry Falwell joined the debate on the resource war in which -as he claimed - we are engaged "whether guns are being fired or not". See Jerry Knight and Peter Behr (note 62).
66. Rep. James Santini, in U.S. Cong., House Com. on Interior and Insular Affairs, Subcom. on Mines and Mining. Monfuel

- Minerals Policy Review. Hearing, 96th Cong., 2d sess., Sep. 18, 1980, p. 1. Washington: U.S.G.P.O., 1980.
67. Houser (note 2) 20.
68. Fine, in Strategic Minerals: A Resource Crisis (note 2) 30.
69. See Legvold (note 2).
70. Bullis (note 2) 167-70.
71. W. Raymond Duncan, "Soviet Power in Latin America: Success or Failure?" in Robert H. Donaldson, ed. The Soviet Union in the Third World: Successes and Failures 1, 6. Boulder, CO: Westview Press, 1981.
72. See, e.g., Anderson (note 2) 70; Severin (note 2) 50; U.S. Minerals Dependence on South Africa. A Report to the Committee on Foreign Relations U.S. Senate, Oct. 1982, 97th Cong., 2d sess. Washington: U.S.G.P.O., 1982, p. 7. However, there are exceptions. For example, Gen. William C. Westmoreland, a former U.S. Chief of Staff, believes in the threat of Soviet military and naval incursions. See his opinion quoted in Barnett (note 2) n.
73. See Thomas T. Hammond, Red Flag over Afghanistan: The Communist Coup, the Soviet Invasion, and the Consequences 143-44. Boulder, CO: Westview Press, 1984.
74. See definition of aggression adopted by the U.N. General Assembly Dec. 14, 1974. G.A.O.R., 29th sess., Supp. No. 19 (A/9619 and Corr. 1) in Resolution 3314 (XXIX), reprinted in American Journal of International Law 69, no. 2 (April 1975) 480, Art. 3.
75. However, concern has been expressed in Western Europe that the European NATO members could be blackmailed by the Soviet Union into submission by a Soviet naval action cutting them off from their overseas supplies, the United States failing to challenge the Soviet Union at sea and making a deal with it to avoid escalation. See three disturbing scenarios in Foreign Affairs Research Institute (note 64) 6-10.
76. As noted by Legvold (note 2) 55, Admiral Gorshkov stresses the importance of the sea as the supply route of NATO. See Sergey G. Gorshkov, The Sea Power of the State, 2d ed. Annapolis, MD: Naval Institute Press, 1979. For potential Soviet threat in the Caribbean see Jiri Valenta, "Soviet Strategy in the Caribbean Basin," U.S. Naval Institute Proceedings 108 (May 1982) 163, 170-71.

77. On the two Shaba invasions of 1977 and 1978 see Morris Rothenberg, The USSR and Africa: New Dimensions of Soviet Global Power 51-66. Washington: Advanced International Studies Institute, 1980; Jiri Valenta and Shannon Butler, "East German Security Policies in Africa," in Michael Radu, ed. Eastern Europe and the Third World: East vs. South 142, 153-55. New York: Praeger, 1981.
78. For an examination of Soviet military ties with Africa see Rothenberg (note 77) 73-79. See also briefly Daniel S. Papp, "The Soviet Union and Southern Africa," in Donaldson, ed. (note 71) 69, 78.
79. Out of this number, however, only 500 were in southern Africa (200 in Angola and 300 in Mozambique), with major contingents in Ethiopia (2,400), Libya (1,800), and Algeria (1,000). 200 were in Mali and 900 in other African countries. International Institute for Strategic Studies, The Military Balance 1983/84 78 [hereinafter pagination follows reprint in Air Force Magazine, Dec. 1983.]
80. Ibid. (note 79)
81. The Military Balance 1983/84, 80. (450 in Angola; 100 in Mozambique, 250 in Algeria; 550 in Ethiopia; 400 in Libya; and 125 in Guinea).
82. Ibid. (160 in Iraq; 75 in South Yemen; and 210 in Syria).
83. Id. 123. However, Cuba announced the intention to cut its troops strength in Ethiopia to fewer than 3,000 by June 1984. See "Cuba Said to Be Pulling Troops Out of Ethiopia," New York Times, Jan. 25, 1984, p. 3, cols. 3-4.
84. The Military Balance 1983/84 (note 79) 123.
85. The major recipients of Soviet military aid have been: Angola (under military cooperation agreements, the latest in 1983), Ethiopia, Guinea, Guinea-Bissau, Mali, Mozambique, Nigeria, Uganda, Zambia, and Somalia. Id. 102. See also Papp (note 78) 78-83; Chester A. Crocker and William H. Lewis, "Missing Opportunities in Africa...", Foreign Policy 35 (Summer 1979), 142, 150-51.
86. See Henry Trofimenko, "The Third World and the U.S.-Soviet Competition: A Soviet View," Foreign Affairs 59, no. 5 (Summer 1981) 1021, 1033. Trofimenko makes one exception "of the temporary presence of Soviet troops in Afghanistan, which has been caused by extraordinary circumstances." (!). Ibid. For a general

view of the Soviet perception of the Soviet Union's relations with Africa see E.A. Tarabrin, ed. USSR and Countries of Africa (Friendship, Cooperation, Support for the Anti-Imperialist Struggle).

Moscow: Progress Publishers, 1980.

87. See David K. Hall, "Naval Diplomacy in West African Waters," in Stephen S. Kaplan et al. Diplomacy of Power: Soviet Armed Forces as a Political Instrument 519-69. Washington: Brookings Institution, 1981.
88. See generally Arthur Jay Klinghoffer, "The Soviet Union and Angola" in Donaldson, ed. (note 71): 97-124.
89. The Military Balance 1983/84 (note 79) 102.
90. Id. 95. See also Rothenberg (note 77) 85.
91. See, e.g., Robert J. Hanks, The Cape Route: Imperilled Western Lifeline. Cambridge, MA: Institute for Foreign Policy Analysis, 1981. However, in any Soviet master plan South Africa would certainly be the "supreme target". See Rothenberg (note 77) Ch. X. It might be added here that in 1983 a former commander of South Africa's main naval base and tracking station and his wife were sentenced to life and ten years imprisonment respectively for spying for the Soviet Union. New York Times, Jan. 1, 1984. BBC World Service, 31, 1
92. The Military Balance 1983/84 (note 79) 102.
93. Id. 121.
94. Statement by Rear Admiral William S. Mott (U.S. Navy, ret.) (note 2) 25.
95. Among others, see, e.g., Barnett (note 2); Mott (note 2); and especially Rocco M. Paone, "Soviet Policy in Southern Africa," American Intelligence Journal 5, no. 2 (July 1983): 12-24.
96. See Papp (note 73) for a table of major Soviet-southern African visits in the years 1976-79.
97. The Military Balance 1983/84 (note 79) 102.
98. Id. 95.
99. Id. 95, 102.
100. Id. 95.
101. Rothenberg (note 77) 86. Cf. the technical cooperation agreement of Roumania with the Sudan of 1982. The Military Balance 1983/84 (note 79) 95.
102. Szuprowicz (note 3) 189-93. See also Duncan (note 71) 6, stressing Soviet desire to gain access to Latin American strategic resources

- and willingness to cooperate even with military-ruled but mineral-rich states, e.g. Brazil.
103. See. e.g. Barnett (note 2)n.p.
 104. Legvold (note 2) 68. See also Robert Legvold, "The Super Rivals: Conflict in the Third World," Foreign Affairs 57, no. 4 (Spring 1979) 755, 772. As emphasized by Legvold (note 2)71, one must distinguish between the Soviet Union's dedication to produce a situation with a denial potential from its behavior merely taking advantage of an emerging situation. Cf. Klinghoffer (note 88) 112, who does not consider it likely that the Soviet Union got involved in Angola primarily in order to be in a better position to cut off the flow of oil to the West.
 105. Houser (note 2) 18.
 106. Price (note 2) 92-93; U.S. Minerals Dependence on South Africa (note 72) 8.
 107. Price (note 2) 92-93.
 108. U.S. Minerals Dependence on South Africa (note 72) 8.
 109. For an examination of the stability of the economic and political structure of Zaire, Zimbabwe, and South Africa see the report in U.S. Congress, House Com. on Interior and Insular Affairs, Subcom. on Mines and Mining, Sub-Sahara Africa: Its Role in Critical Mineral Needs of the Western World. 96th Cong., 2d sess., July 1980. Washington: U.S.G.P.O., 1980. This Report is summarized in A Congressional Handbook (note 2) 310-20. See also note 35.
 110. For details of scenarios under which critical mineral exports from South Africa might be interrupted see U.S. Congress, Senate Com. on For. Relations, Subcom. on African Affairs, Imports of Minerals from South Africa by the United States and the United States and the OECD Countries. Prepared by the Congressional Research Service of the Library of Congress. 96th Cong., 2d sess., Sep. 1980. Washington: U.S.G.P.O., 1980. For a comprehensive survey see U.S. Minerals Dependence on South Africa (note 72) 1-15.
 111. United Nations Charter, Art. 41.
 112. See in particular two Resolutions of the U.N. Security Council: Res. 232 of Dec. 16, 1966; U.N. Security Council Off. Rec., 21st Year, p. 7; and Res. 253 of May 29, 1968; U.N. Security Council Off. Rec., 23d Year, p. 5.

113. It is common knowledge that sanctions imposed by international organizations have not proved effective. For some time even the United States, under the so-called Byrd Amendment to the Strategic and Critical Materials Stock Piling Act, 50 U.S.C. paras. 98-98h (1971) authorized, for reasons of national security, importation of Rhodesian chromite. The Amendment was finally repealed in 1977. For documentation on the laws repealing and reinstituting the embargo see International Legal Materials 11, no.1 (Jan. 1972): 178-79; and Id. 16, no.2 (March 1977): 425-27.
114. In the past, African-sponsored resolutions, proposing economic sanctions against South Africa, were vetoed by the three Western permanent members of the Security Council. See UN Chronicle 14, no. 11 (Dec. 1977) 6.
115. See Mott (note 2) 8-9; Barnett (note 2) n.p.
116. Quoted in Barnett (note 2) n.p.
117. Mott (note 2) 9, quoting Stalin, Works vol. 5, pp. 57-53. Moscow, 1953.
118. Id. 10, quoting Khrushchov's address at the University of Jakarta in 1960.
119. Two statements by Brezhnev have been quoted. The first was supposed to have been made at a secret meeting of Warsaw Pact countries' leaders in Prague in 1973, Brezhnev stating that the Soviet objective was world dominance by 1985 (!) and that the Soviet control of Europe's sources of energy and raw materials would reduce it to the condition of a hostage of Moscow. See Barnett (note 2), quoting Robert Moss, former editor of the Foreign Report intelligence bulletin of The Economist. The other statement, allegedly made to Siad Barre (when he was still Moscow's client), proclaimed the Soviet aim "to gain control of the two great treasure houses on which the West depends - the energy treasure house of the Persian Gulf and the mineral treasure house of central and southern Africa." This was quoted without referring to any source by Nixon. See Richard M. Nixon, The Real War 23. New York: Random House, 1980.
120. See Mott (note 2) 11-14, quoting Ilya Dzhirkvelov, a KGB defector, to the effect that the Soviet Union has been paying

much attention to the "resource war" since mid 1940s, especially as far as oil is concerned. As evidence Dzhirkvelov referred to Soviet abortive attempts just after the Second World War to control Iranian oil; Stalin's turn in his Middle Eastern policy from very warm relations with Israel to supporting the Arabs; and the Soviet Foreign Trade Minister's Patolichev's remark in the Sudan in 1971 on great strategic and political importance of oil and gas.

121. Barnett (note 2) refers to a book by a Soviet Major General, named A.N. Lagovskiy, entitled Strategy and Economics, in which the general argues for a Soviet effort to control strategic materials as a means of debilitating the American economy.
122. Mott (note 2), referring to Sakharov's book My Country and the World and an article of his in Kontinent, no. 16 (1978), confirming that the Soviets have designs to deny strategic materials to the West.
123. See in particular Daniel I. Fine (note 2); Id., in Strategic Minerals: A Resource Crisis (note 2) 30-32.
124. Fine, in The Resource War in 3 D (note 2). Also referred to in Herbert E. Meyer, "Russia's Sudden Reach for Raw Materials. Long an Exporter, the Soviet Union Is Now Competing with the West for Strategic Minerals," Fortune 102 (July 28, 1980) 43, 44.
125. Statement by William Casey, cited in Mott (note 2) 17-18.
126. As put by Fine, the Soviet Union has no "conventional internationally recognized buyer capability." See The Resource War in 3 D (note 2) 37.
127. There is no consensus on the adequacy of the evidence. Whereas Legvold believes that the evidence for the shift is "limited and highly questionable", Bullis finds that for certain strategic materials it appears to be "well documented". Legvold (note 2) 71; Bullis (note 2) 174.
128. Severin (note 2) 49; Bullis (note 2) 173, 174.
129. Legvold (note 2) 75, underestimates this determination of the Soviet Union.
130. This is the view of Severin (note 2), Legvold (note 2), Bullis (note 2), and such experts as geologists and dealers at the London Metals Exchange, the major world center for trade in strategic minerals. Anderson (note 2) 78.

131. In this regard, concern has been expressed about the role of transnational companies which assign priorities to the financial success of their investments rather than national interest. For example, at one time prices of germanium rose sharply not so much because of withdrawal of Soviet supplies and uncertainty over the African sources as because of commercial speculations of investors. Anderson (note 2) 71. In the United States strategic materials are promoted as a good investment, the leading promoter being James Sinclair & Co. of New York. See Knight and Behr (note 62) 17. See also "Adventurous Investing in Strategic Materials," Business Week, Oct. 12, 1981, p. 170-01+.
132. Among many analyses of this scenario see Klinghoffer (note 56) 571-74; Ebinger (note 56) 201-06; Henry S. Rowen and John P. Weyant, "Trade-off between Military Policies and Vulnerability Policies," in James L. Plummer, ed. Energy Vulnerability, 305, 307-08. Cambridge, MA: Ballinger, 1982; Ian Smart, "Energy and the Power of Nations," in Yergin and Hillenbrand, eds. (note 11) 349, 368-70.
133. Odell (note 11) 71, believes that it is almost certain that the Soviet Union will move even further ahead of the United States in oil and gas production. See also Smart (note 132) 369-70; James Ellis, "Warsaw Pact Energy Situation Prospects - Implications for the West," NATO Review 29, no. 2 (April 1980) 29, 33.
134. Ebinger (note 56) 201-03; Rowen and Weyant (note 132) 308; Ellis (note 133) 31. See also Jochen Bethkenhagen, "CONECON Energy Problems and the West," NATO Review 26, no. 1 (Feb. 1978): 20-24; NATO Colloquium (note 54); George W. Hoffman, Eastern Europe's Resource Crisis, with Special Emphasis on Energy Resources: Dependence and Policy Options. Austin, Texas: The U. of Texas, Center for Energy Studies, 1981; D. Park, Oil and Gas in Comecon Countries. London: Kogan Page, 1979.
135. Ebinger (note 56) 203.
136. See, e.g., Smart (note 132) 368; Ebinger (note 56) 204; Klinghoffer (note 56) 573. See also Seweryn Bialer, "The Harsh Decade: Soviet Policies in the 1930's," Foreign Affairs 59, no. 5 (Summer 1981) 999, 1017.

See, however, Herbert E. Meyer who believes that the Soviet Union would consider the seizure of Middle East oil as a solution to its energy crisis. Meyer, "Why We Should Worry about the Soviet Energy Crunch," Fortune (25 Feb. 1980) 85. Should this be the Soviet option, the intervention in Afghanistan could be interpreted as a step toward the Persian Gulf. See Hammond (note 73) Ch. 18, suggesting a number of scenarios for a Soviet move in the area: intervention in a civil war in Iran; the Baluchistan question; and the Pakistan and North Yemen scenarios.

137. See, e.g., Ebinger (note 56) 204; Smart (note 132) 268.
138. See Ebinger (note 56) 194; Klinghoffer (note 56) 571.
139. This point of view is represented by Bullis (note 2) and Legvold (note 2).
140. In this profiteering scheme the Soviet hard currency earnings from the sale of petroleum in 1973 increased by \$ 600 million or twice the 1972 earnings. See details in Coldman (note 53) 88-90.
141. However, the dumping of the Rhodesian chrome is believed by some to have resulted from domestic overproduction and even caused damage to the Soviet economy. Anderson (note 2) 78.
142. Legvold (note 2) 64. On the other hand, this purchase could be interpreted as a normal action of any consumer buying to supplement domestic underproduction. Anderson (note 2) 78.
143. The rise in the price of cobalt even provided incentive for substitution. Severin (note 2) 51.
144. Simon D. Strauss, Mineral Self-Sufficiency - The Contrast between the Soviet Union and the United States 8. Washington: American Mining Congress, 1979, cited by Legvold (note 2) 63.
145. For an examination of this question see Szuprowicz (note 3) Ch. 7.
146. Severin (note 2) 51; Shafer (note 2) 160.
147. See especially Legvold (note 2).
148. The Soviet Union has used the economic weapon against its allies, e.g., Yugoslavia, China, and occasionally Poland, but, eager to continue trade relations with the West, it has not

been willing to use its position as a supplier of strategic materials as a weapon to achieve its foreign policy goals. Exceptions are: cutting off supplies of manganese, chromite, and platinum group metals to the United States during the Berlin crisis of 1948, which did not, however, seriously affect U.S. weapons production; Shafer (note 2) 162; and the curtailment of chromite exports to the United States during the Korean war, lasting until 1960; U.S. Minerals Dependence on South Africa (note 72) 9.

149. Contingency plans for war time defense of sea lanes are a separate concern which cannot be entered into in this paper.
150. See generally Szuprowicz (note 3) Ch. 11.
151. The Strategic and Critical Materials Stock Piling Act of 7 Jun 1939, 53 Stat 811. For a convenient background history of the U.S. stock piling system including the inventory of the stockpile materials as of July 31, 1981 see A Congressional Handbook (note 2) 230-50. For a comprehensive overview of the U.S. stockpile system and policy see The President's National Materials and Minerals Program and Report to Congress (note 2) 14-24. For hearings on the bill to amend the 1939 Act see U.S. Congress Senate. Strategic Stockpiles. Hearings before the Subcom. on Preparedness of the Com. on Armed Services, 97th Cong., 2d sess June 9, 10, 1982. Washington: U.S.G.P.O., 1982.
152. See The President's National Materials and Minerals Program and Report to Congress (note 2) 17 (Fig. 2).
153. For a critical assessment of the U.S. stockpile system see Shafer (note 2) 161-63; Prepared Statement of Senator Harrison Schmitt, in Strategic Stockpiles (note 151) 33-36.
154. Shafer (note 2) 164-66.
155. For a review of the West European and Japanese stockpile situation see Szuprowicz (note 3) 226-29. On Canada see Finlayson (note 37) 21. It must be noted that in a number of West European countries (e.g. France and West Germany) private commercial inventories complement stockpiling. Szuprowicz (note 3) 208, 226, 227; Shafer (note 2) 165.
156. See generally A Congressional Handbook (note 2) 250-53; Szuprowicz (note 3) 196-200.

157. See generally A Congressional Handbook (note 2) 263-78.
158. Id. 279-83.
159. See H.Dana Moran, "Substitution - Some Practical Considerations," In U.S.Congress, Office of Technology Assessment, Engineering Implications of Chronic Materials Scarcity 284. Washington: U.S.G.P.C., April 1977.
160. For a review of the substitution potential of the eight minerals see A Congressional Handbook (note 2) 258-62. See also a general metallic minerals substitution matrix in Szuprowicz (note 3) 198-99.
161. A Congressional Handbook (note 2) 258-62.
162. Id. 283.
163. About one third of the land in the United States is in public ownership. 60 -70 % of this land is entirely or partially closed to mineral exploration and development. Id. 296-97. For a detailed study of the mineral potential of U.S. public land see The President's National Materials and Minerals Program (note 2) 239-553. See also Matten S. Yoder, Jr., "Strategic Minerals: A Critical Research Need and Opportunity," Proceedings of the American Philosophical Society 126, no. 3 (1982): 229-41. Exploration of U.S. public lands is likely to reveal reserves capable of covering 20-25 % of U.S. chromium, cobalt, and platinum consumption and significant amounts of copper, nickel, and uranium. Shafer (note 2) 158.
164. There exists a vast literature on all aspects of deep sea bed mining. For a comprehensive treatment see Elisabeth Mann Borgese and Paul M.T. White eds. Seabed Mining: Scientific, Economic, Political Aspects: An Interdisciplinary Manual. Msida, Malta: International Ocean Institute, 1981. See also International Ocean Symposium, Tokyo, 1978. The Deep Seabed and Its Mineral Resources. Tokyo: Ocean Association of Japan, 1979; Alexandra Merle Post, Deepsea Mining and the Law of the Sea. The Hague: Nijhoff, 1983. For a bibliographical survey of books on the sea bed mining see Louis F. E. Goldie, "A Selection of Books Reflecting Perspectives in the Seabed Mining Debate," Part I: International Lawyer 15 (1981): 293-337; Part II: Id. 445-98 (1981).

165. United Nations Convention on the Law of the Sea, Montego Bay, December 10, 1982. U.N. Doc. A/CONF. 62/ 122, reprinted in International Legal Materials 21, no.6 (Nov. 1982): 1261-1354.
166. See generally William B. Jones, "The International Sea-Bed Authority without the U.S. Participation," Ocean Development and International Law (1983): 151-71; Otho E. Eskin, "U.S. Administration Views on the Law of the Sea," in Edward L. Miles Scott Allen, eds., The Law of the Sea and Ocean Development Issues in the Pacific Basin. Honolulu: Law of the Sea Institute 1983, pp. 277-81, 282-314.
167. See generally, F.M. Auburn, Antarctic Law and Politics 241-67. Bloomington: Indiana U. Press, 1982; Philip W. Quigg, A Pole Apart: The Emerging Issue of Antarctica 87-98, 193-201. New York: McGraw-Hill, 1983.
168. See generally A Congressional Handbook (note 2) 339. More ambitious plans by analysts who are very much alarmed about the East-West confrontation in the Third World call for expanding NATO into a global "Tri-Oceanic Alliance" or "All Oceans Alliance". See, e.g., Bartlett (note 2) n.p.; Szuprowicz (note 3) 66, 216-17.
169. See Declaration on the Establishment of a New International Economic Order, May 1, 1974, U.N.G.A. Res. 3201 (S-VI), 6 (Special) U.N. G.A.O.R., Supp. (No. 1) 3, U.N. Doc. A/9556 (1974), reprinted in International Legal Materials 13, no.3 (May 1974): 715-19.

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